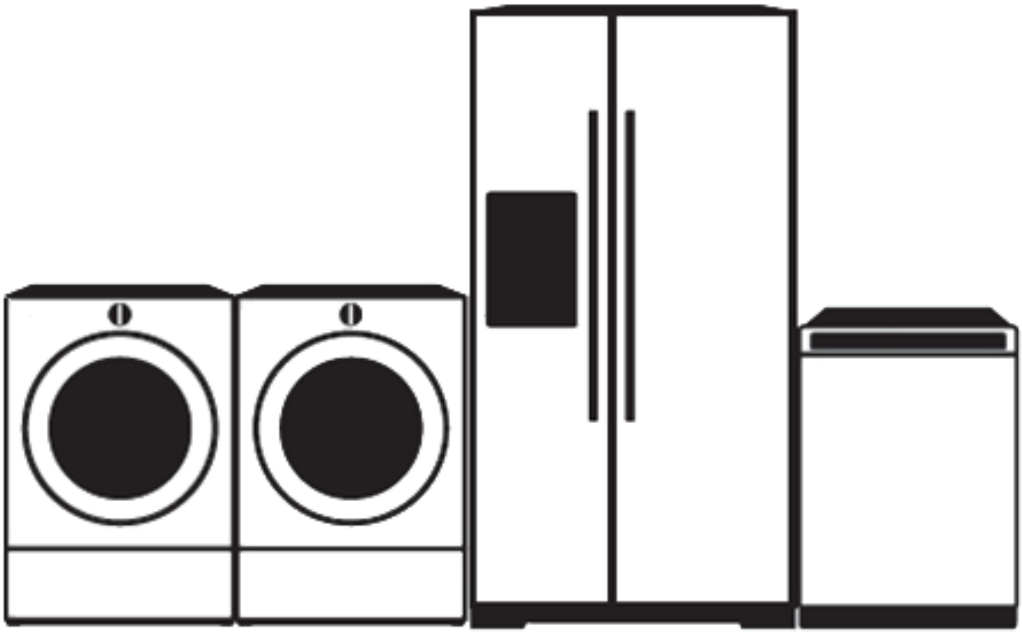
CA-01

Whirlpool®
HOME APPLIANCES

TECHNICAL EDUCATION

6th sense technology Live™

CONNECTED SMART APPLIANCES



WFL98HEBU WEL98HEBU WRL767SIAM WDL785SAAM

JOB AID W10548650

FORWARD

This Whirlpool Job Aid, “6th Sense Live - Connected Smart Appliances” (P/N W10548650), provides the In-Home Service Professional with information on the installation, operation, and service of the “Smart Appliance.” For specific information on the model being serviced, refer to the “Use and Care Guide,” “Installation Instructions,” or “Tech Sheet” provided with the appliance.

The Wiring Diagrams used in this Job Aid are typical and should be used for training purposes only. Always use the Wiring Diagram supplied with the product when servicing the appliance.

GOALS AND OBJECTIVES

The goal of this Job Aid is to provide information that will enable the In-Home Service Professional to properly diagnose malfunctions and repair the “Smart Appliance.”

The objectives of this Job Aid are to:

- Understand and follow proper safety precautions
- Successfully troubleshoot and diagnose malfunctions
- Successfully perform necessary repairs
- Successfully return the dishwasher to its proper operational status

WHIRLPOOL CORPORATION assumes no responsibility for any repairs made on our products by anyone other than authorized In-Home Service Professionals.

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PRODUCT SPECIFICATIONS & WARRANTY INFORMATION SOURCES (inside back cover)

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Section 1: General Information

This section provides safety and general information for Smart Grid, 6th Sense Live technology, and Connected Smart Appliances.

- Safety First
- Glossary of Terms, Abbreviations, and Acronyms
- Smart Appliance ECM Specifications
- What is Smart Grid?
- What is a Smart Appliance?
- Whirlpool Smart Device Network
- How the Smart Appliance Talks to the Internet?
- Smart Appliance Block Diagram
- Smart Grid Event
- Smart Appliance Functions & Features
- Notes

Safety First

Your safety and the safety of others are very important.

We have provided many important safety messages in this manual and on your appliance. Always read and obey all safety messages.

This is the safety alert symbol.

This symbol alerts you to potential hazards that can kill or hurt you and others.

All safety messages will follow the safety alert symbol and either the word “DANGER” or “WARNING.” These words mean:

DANGER — **You can be killed or seriously injured if you don't immediately follow instructions.**

WARNING — **You can be killed or seriously injured if you don't follow instructions.**

All safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tell you what can happen if the instructions are not followed.

Glossary of Terms, Abbreviations, and Acronyms

TERM	DEFINITION
ACU	Appliance Control Unit: The electronic control that manages the appliance's loads and in some cases the user interface. *See also CCU.*
CCU	Central Control Unit: The electronic control that manages the appliance's loads and in some cases the user interface. *See also ACU.*
ECM	External Communications Module: The ECM is a common cross-platform design that provides the interface between the Smart Grid appliance and the Internet. It communicates to the appliance using Reveal/WIDE and to the Internet using Wi-Fi. The ECM also provides AC/DC power conversions, and the power measurement of Smart Grid appliance.
HAN	Home Area Network: In-premise communication system.
IHD	In Home Display: A standalone device, such as a computer, laptop, tablet, or cell phone with Internet connectivity.
6th Sense Live and "smart" appliance	The ability to reliably and predictably reduce appliance energy consumption in real-time, represents a significant energy efficiency and conservation opportunity. Smart appliances will be capable of delivering targeted energy efficiency, through substantial curtailment of energy consumption at the precise and varying times when the efficiency and environmental benefits are greatest and most needed.
WIDE/REVEAL	Whirlpool proprietary communication protocols designed for controlling appliances—and used by the ECM modules in Smart Appliances.
WISE	Whirlpool Integrated Service Environment: a back office system that provides an environment for consumers, service providers, utilities, government, appliance manufacturers, to participate in the Smart Grid and provide value-added services to consumers.
WPS	Wireless Protected Setup: A computing standard that attempts to allow easy establishment of a secure wireless home network.
WSDN	Whirlpool Smart Device Network: Consists of a Home Area Network, Energy and Utility Domain, and an Internet Domain.

Smart Appliance ECM Specifications

ECM SPECIFICATIONS	
AC Volts:	120V AC (Nominal) 90-140V AC (Acceptable Range)
Frequency:	58-62 Hz
DC Volts:	3.3V DC (± 5%) 5.0V DC (± 5%)
Operation Temperature:	Min: 0° C, Max: 75° C
Storage Temperature:	Min: -40° C, Max: 105° C
Relative Humidity:	Min: 10%, Max: 98%

6th Sense Live Technology Overview

What Is Smart Grid?

SmartGrid.gov defines Smart Grid as a developing network of new technologies, equipment, and controls working together to respond immediately to our 21st century demand for electricty.

The basic concept of Smart Grid is to add monitoring, analysis, control, and communication capabilities to the national electrical delivery system to maximize the throughput of the system while reducing the energy consumption. The Smart Grid will allow utilities to move electricity around the system efficiency and economically. It will also allow the homeowner and business to use electricity economically. For example, you may want to keep your house set at 75° F (24° C) in the summer time when prices are low, but you may be willing to increase your thermostat to 78° F (25.5° C) if prices are high. Similarly, you may want to dry your clothes for 5 cents per kilowatt-hour at 9:00 in the evening instead of 15 cents per kilowatt-hour at 2:00 in the afternoon. You will have the choice and flexibility to manage your electrical use while minimizing your costs.

What is a Smart Appliance?

Smart appliances will be capable of delivering targeted energy efficiency, through substantial curtailment of energy consumption at the precise and varying times when the efficiency and environmental benefits are greatest and most needed. Additionally, the Whirlpool Smart Appliances have the ability to communicate with the consumer via smartphone, tablet or laptop using wireless (Wi-Fi) technology, allowing the consumer to control and manage them. For example, the refrigerator will let you know when it's time to change the water filter, or the washer will tell you how many minutes are remaining until it's finished.

The Whirlpool Smart Device Network

The Whirlpool Smart Device Network (WSDN) consists of a Home Area Network (HAN), Internet and Energy Domain. The ECM is part of the Home Area Network whose main function is to provide connectivity for the Smart Appliances to the Internet. See Figure 1.

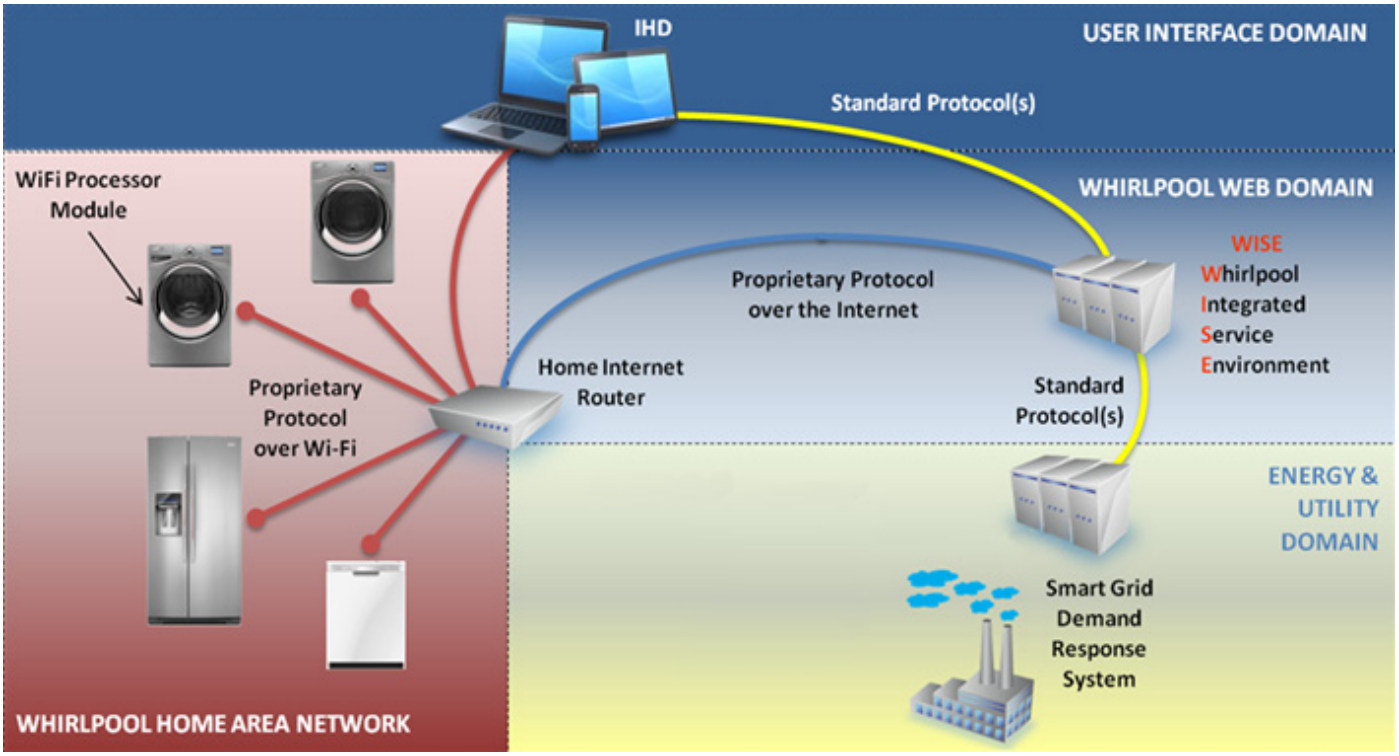


Figure 1 - Whirlpool Smart Device Network

How does the Smart Appliance talk to the Internet?

A Wi-Fi® Processor Module (WPM) or Electronic Control Module (ECM) is built into the Smart Appliance. After provisioning, the Smart Appliance becomes part of the Home Area Network and then has a pathway to the Internet in which to connect to the Whirlpool Integrated Service Environment (WISE).

All communication pathways are enabled via the ECM in the appliance. The ECM communicates to the appliance internally via WIDE/Reveal and to Internet via Wi-Fi® over TCP/IP.

Figure 2 - Home Area Network (HAN) System Overview

Typical Smart Appliance Block Diagram

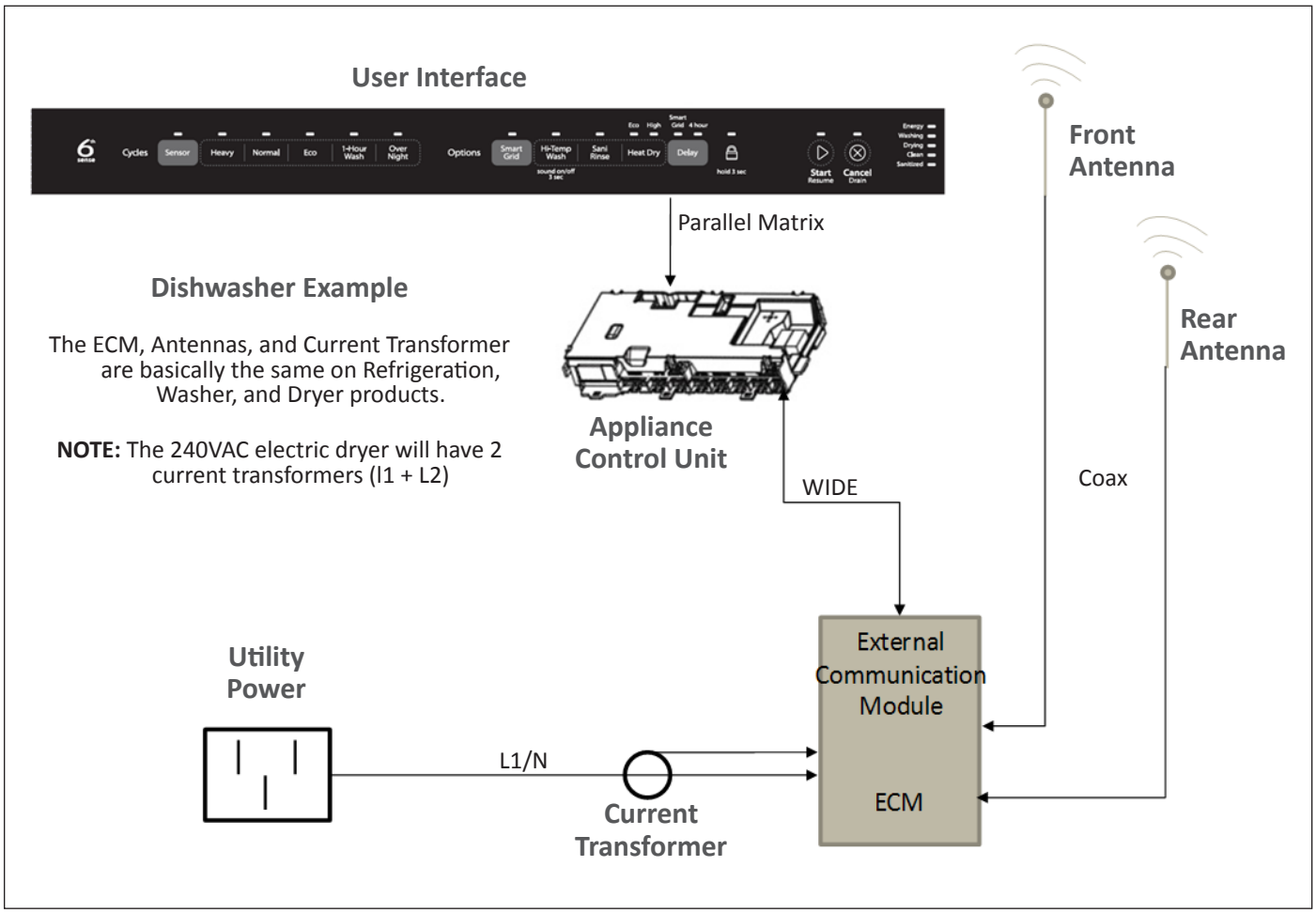


Figure 3 - Smart Appliance Block Diagram

Smart Grid Event

A Smart Grid event occurs when the utility company sends a notification of high energy use on the electric grid.

Smart appliances can receive these notifications and adjust or delay certain functions to reduce energy use during these events.

Smart Delay:

When a Smart Delay is active and a consumer starts a cycle, the appliance shall go into delay for the duration of the event. If the consumer momentarily presses the Smart Grid button to override the Smart Delay function, the appliance shall start and operate with the cycle & options selected by the consumer.

If the event is received while the appliance is running a cycle, the appliance shall minimize energy, if possible based on the state of the cycle; otherwise, the appliance shall continue to operate in the cycle selected by the consumer.

NOTE: If, during a Smart Grid event notification, a dishwasher or clothes washer that is set to run any cycle that uses Sanitize temperatures will function normally (no Smart Delay).

Smart Appliance Functions & Features

	Refrigerator	Dishwasher	Washer	Dryer
Model	WRL76SIAM	WDL785SAAM	WFL98HEBU	WEL98GEBU
Notifications	Power-Out Alert Door Open Alert Power-On Nudge Water Filter	Dishes Clean Affresh® Nudge	Error Message Detergent Nudge Affresh® Nudge Clothes Clean	Error Message Airflow Alert Clothes Dry
Assistant	Vacation Assistant Temp Set Assistant	Control Lock	FanFresh Cycle® Assistant Remote Start/Pause	Wrinkle Shield™ Cycle Assistant Remote Start/Pause
Stats	Start Date	Start Date Cycle Progress Cycle Counter	Start Date Cycle Progress Cycle Counter	Start Date Cycle Progress Cycle Counter
Buy Supplies	Water Filter Extended Warranty	Affresh® Dishwasher Cleaner Affresh® Stainless Steel Cleaner Extended Warranty	Affresh® Washer Cleaner Extended Warranty	Extended Warranty
Energy	Energy Advisor Rate Revealer Smart Delay	Energy Advisor Rate Revealer Smart Delay	Energy Advisor Rate Revealer Smart Delay	Energy Advisor Rate Revealer Smart Delay

Notes

Section 2: Operation

This section provides operational information for the "6th Sense Live - Connected Smart Appliances."

- Using Smart Grid
- Provisioned
- Not Provisioned
- Smart Grid LED
- Smart Delay
- Smart Delay ICON or LED
- Smart Appliance Features

Using Smart Grid

Once the setup process has been competed for the appliance(s), the Smart Grid function will default to ON (Smart Grid indicator is lit) as long as it is communicating with the router, and if the router has an Internet connection established.

With Smart Grid functions ON and the Smart Grid status normal, the blue Smart Grid indicator will light. If a Smart Grid event occurs, such as peak usage or peak pricing, the Smart Delay indicator on the console will light and any current cycle or the start of a new cycle will be delayed until the event is complete.

The Smart Grid function for the current cycle may be turned OFF by pressing the Smart Grid button on the appliance. The indicator will turn off as a reminder that the Smart Grid functions are off. The Smart Grid function will automatically turn back on for the next cycle.

Figure 1

Provisioned

The following conditions may exist when the appliance is provisioned with the Wireless Router.

- When the appliance is provisioned and connected to the Internet, the default state of the Smart Grid is ON except when 1-Hour Wash is selected on dishwasher.
- When the appliance is provisioned and connected to the Internet, pressing the Smart Grid button shall toggle the state from ON to OFF or OFF to ON.
- When the appliance is provisioned and connected to the Internet, the Smart Grid button shall operate as an Option button with the exception that the Smart Grid State can be enabled or disabled during a cycle, so that a consumer can override the appliance's response to a Smart Grid Mode request.
- When the appliance is provisioned, pressing and holding the Smart Grid button for approximately 15 seconds shall reset the ECM to its factory default settings so that it can be provisioned to another Wireless Router.
- When the appliance is provisioned, the Smart Grid LED will be lit if the appliance has a communication link with the Internet and the Smart Grid state is ON.
- When the appliance is provisioned, the Smart Grid LED will not be lit if the appliance does not have a communication link with the Internet or the Smart Grid state is OFF.
- Smart Grid LED: The Smart Grid LED blinks ON and OFF slowly during the provisioning process.
- The User Interface timeout shall be suspended while the appliance is in a provisioning state. The 30 second timeout shall start upon a successful provisioning or an unsuccessful provisioning status is received.
- Toggling the Smart Grid button shall not change the Smart Grid state if the appliance is provisioned and does not have a communication link with the Internet.

Not Provisioned

The following conditions may exist when the appliance is not provisioned with the Wireless Router.

- When the appliance is not provisioned, pressing the Smart Grid button shall initiate the appliance provisioning process.
- The Smart Grid LED will not be lit when not provisioned, or during Cancel/Drain.

Smart Grid LED

The following states pertain to the Smart Grid LED (figure 1):

- The Smart Grid LED is on when Smart Grid is activated.
- The Smart Grid LED is off when communication is lost or machine is in override state.
- The Smart Grid LED is flashing when establishing or re-establishing a connection (provisioning).
- The Smart Grid LED flashes rapidly if the Smart Appliance fails to establish a connection (provisioning).

Smart Delay

Smart Delay allows the Smart Appliance to detect whether the electric grid is in a period of peak usage or rates. If you try to start a cycle during the event, Smart Delay will automatically delay starting the new cycle until the event is complete.

To override Smart Delay mode for one cycle: Press the Smart Grid button to temporarily turn off the Smart Grid function. The blue Smart Grid indicator will turn off. The Smart Grid function will automatically turn back on for the next cycle.

Smart Delay ICON or LED

Figure 2

The following states pertain to the Smart Delay ICON or LED (figure 2):

- Dishwasher Only: The amber LED of the two-color LED, labeled "Smart Delay", indicates whether or not the appliance is in a Smart Grid-initiated delay.
- The Smart Delay ICON or LED shall illuminate when a Smart Delay is initiated.
- The Smart Delay ICON or LED shall turn off when a Smart Delay expires.
- The Smart Delay ICON or LED shall illuminate when a Smart Pause is initiated.
- The Smart Delay ICON or LED shall turn off when a Smart Pause expires.

Smart Appliance Features

Smart Features

The Whirlpool Smart Appliance has built-in Wi-Fi® connectivity, which enables many other features to be accessed by a remote device such as a smart phone, computer, tablet, etc. Below is a summary of these additional features.

NOTE: The features listed on this and the following pages may only apply to certain appliances. Features and functions are subject to change without notice.

Dishwasher Features

SMART NOTIFICATIONS

The consumer can be notified by e-mail, text, or app push if their dishwasher experiences an issue that requires service.

Dishes Clean Notification
Notifies the consumer remotely that their dishes are clean.

Affresh® Nudge

This feature enables the consumer to receive remotely a notification that the dishwasher recommends an Affresh® cycle to be run. Affresh® removes unsightly hard water and filming from the dishwasher and internal operating parts that may affect dishwasher performance.

Control Lock

This feature enables the consumer to remotely change the state of the dishwasher user interface's Control Lock feature.

Start Date

Displays the appliance start date.

Cycle Counter, Cycle Progress

Allows the consumer to remotely check on the progress of a wash cycle, providing up-to-the-minute information on what cycle is running and the estimated time remaining in the cycle.

Smart Energy

- Energy Advisor
- Rate Revealer
- Smart Delay

Allows the consumer to monitor, manage, and control their energy consumption.

Refrigerator Features

SMART NOTIFICATIONS

The consumer can be notified by e-mail, text, or app push if their refrigerator experiences an issue that requires service.

Power Out Alert

In the event the refrigerator loses power, the consumer will be notified when power is restored. This will allow the customer to react appropriately in order to avoid or minimize loss of food.

Door Open Alert

The consumer will receive a notification if either door (refrigerator or freezer) is left open for longer than 10 minutes.

Power On Nudge

The refrigerator will send a message after power is lost and then restored and if the temperature of the refrigerator is out of range.

Water Filter Assistant

This feature enables the consumer to receive the refrigerator water filter change notification remotely.

Vacation Assistant

The consumer shall be able to display the refrigerator's "vacation" mode state, and toggle vacation mode ON or OFF. Setting the refrigerator to low-energy mode when it won't be opened for a while saves money and energy. **NOTE**: changing temperature setpoint will deactivate Vacation mode if it was active after one hour.

Temp Set Assistant

The consumer shall be able to display and adjust the Refrigerator and Freezer compartment temperature settings. **NOTE:** changing temperature setpoint will deactivate vacation mode if it was active.

Start Date

Displays the appliance start date.

Smart Energy

- Energy Advisor
- Rate Revealer
- Smart Delay

Allows the consumer to monitor, manage, and control their energy consumption.

Smart Appliance Features (continued)

Dryer Features

SMART NOTIFICATIONS

The consumer can be notified by e-mail, text, or app push if their dryer experiences an issue that requires service.

Airflow Alert

Continuously monitors the air flow from the dryer, alerting the consumer to lint buildup or other obstructions in the dryer's duct work that can increase drying times and energy use.

Clothes Dry

Receive an e-mail, text, or app push when the current drying cycle is complete, eliminating the need for repeated visits to the dryer to check the status of the drying cycle.

Wrinkle Shield™ Cycle Assistant

If the consumer can't get to the dryer right away to remove the load, they can remotely activate Wrinkle Shield™ to help avoid wrinkling of the load until it's removed from the dryer.

Remote Start/Pause

Allows user to start or pause their Dryer remotely using the Smart appliances app.

Start Date

Displays the appliance start date.

Cycle Counter, Cycle Progress

Allows the consumer to remotely check on the progress of a drying cycle, providing up-to-the-minute information on what cycle is running, how dry the load is, and the estimated time remaining in the cycle. This takes the guesswork out of when to remove items you may want to iron or hang up while slightly damp.

Smart Energy

- Energy Advisor
- Rate Revealer
- Smart Delay

Allows the consumer to monitor, manage, and control their energy consumption.

Washer Features

SMART NOTIFICATIONS

The consumer can be notified by e-mail, text, or app push if their washer experiences an issue that requires service.

Detergent Nudge

The washer will send notifications every cycle regarding the status of the detergent dispenser.

Affresh® Nudge

This feature enables the consumer to receive remotely a notification that the washer recommends an Affresh® cycle to be run. Affresh® keeps the washer smelling fresh and clean when used once per month.

Clothes Clean

Receive an email, text, or app push when the current wash cycle is complete, eliminating the need for repeated visits to the washer to check the status of the wash cycle.

FanFresh® Cycle Assistant

If the consumer can't get to the washer right away to remove the load, they can remotely activate FanFresh® while the washer is running to activate the fan, and tumble the load periodically to keep their laundry fresh.

Remote Start/Pause

Allows user to start or pause their Washer remotely using the Smart appliances app.

Start Date

Displays the appliance start date.

Cycle Counter, Cycle Progress

Allows the consumer to remotely check on the progress of a wash cycle, providing up-to-the-minute information on what cycle is running and the estimated time remaining in the cycle.

Smart Energy

- Energy Advisor
- Rate Revealer
- Smart Delay

Allows the consumer to monitor, manage, and control their energy consumption.

Section 3: Setup & Provisioning

This section provides setup and provisioning requirements and procedures for the "6th Sense Live - Connected Smart Appliances."

- Wireless Configurations
- Create Online Account
- Provisioning Methods
- Auto-Loading App Method
- WPS Setup Method
- Manual Setup Method
- Registering Your Appliances
- Smart Appliance Screen
- Setting Smart Preferences
- Troubleshooting Setup & Provisioning
- Notes

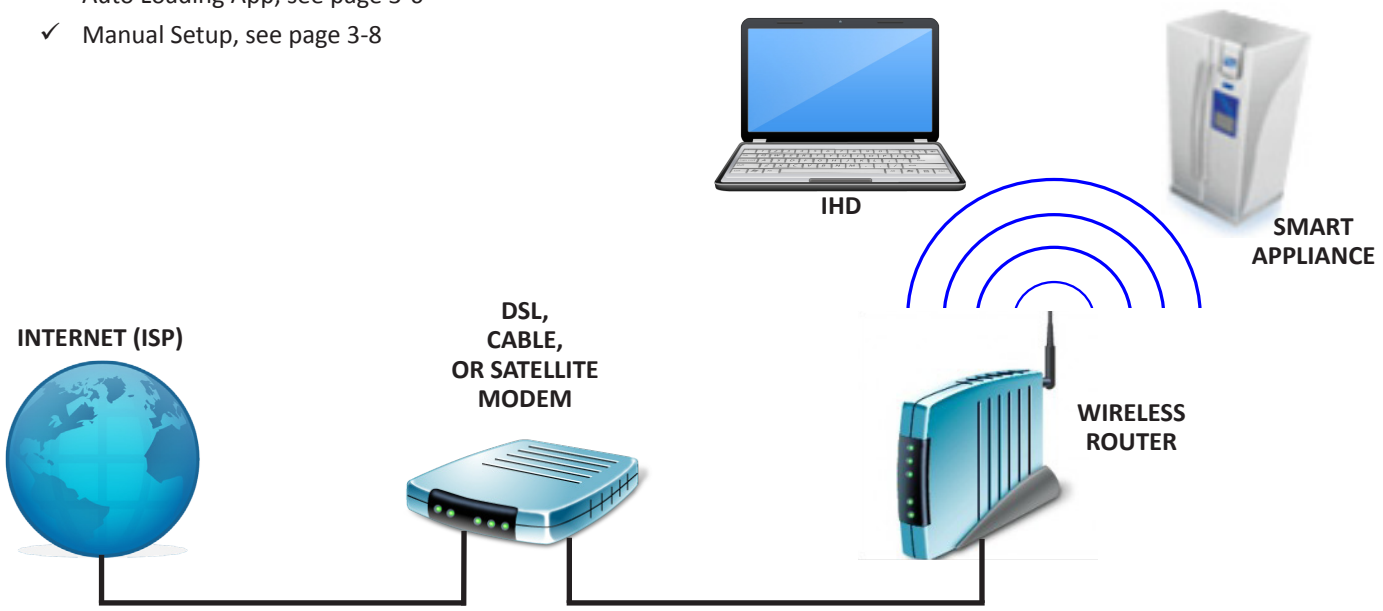
Wireless Configurations

Configuration 1 (Traditional)

ISP → Modem → Wireless Router → In Home Display (IHD) & Smart Appliance(s)

Suggested Provisioning Methods:

- ✓ Push Button WPS, see page 3-7 (if wireless router supports WPS-2 - check manual)
- ✓ Auto Loading App, see page 3-6
- ✓ Manual Setup, see page 3-8

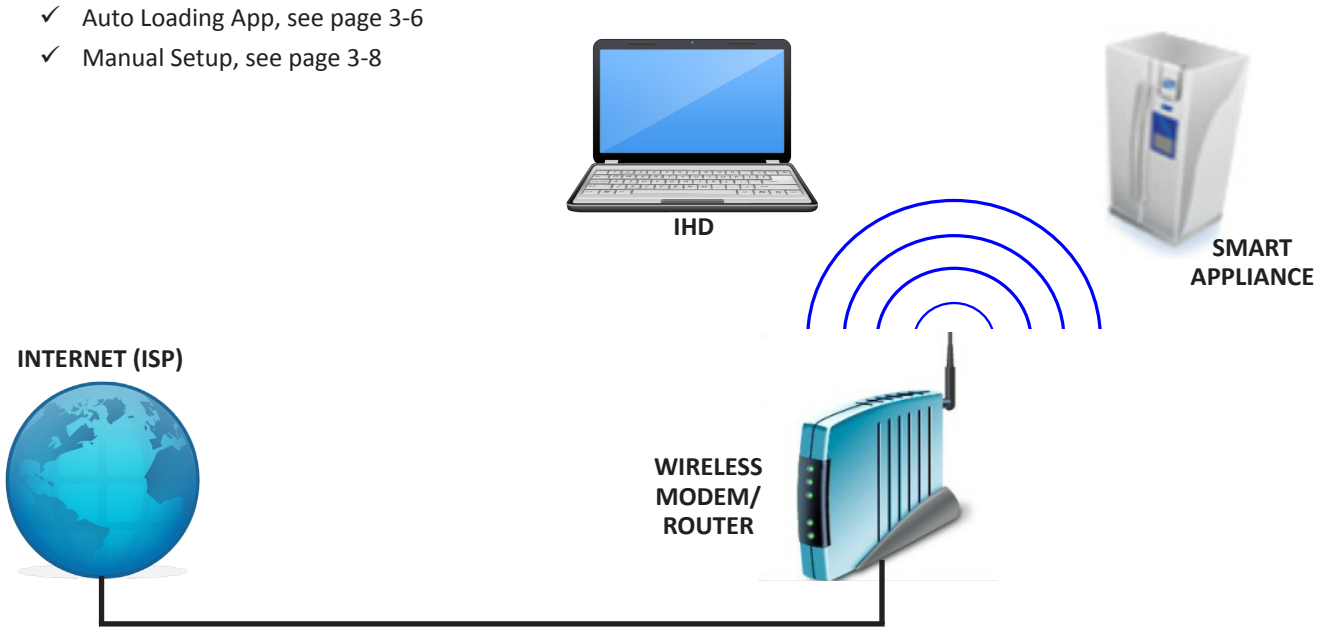


Configuration 2 (Modem/Router Combo)

ISP → Wireless Modem/Router → In Home Display (IHD) & Smart Appliance(s)

Suggested Provisioning Methods:

- ✓ Push Button WPS, see page 3-7 (if wireless router supports WPS-2 - check manual)
- ✓ Auto Loading App, see page 3-6
- ✓ Manual Setup, see page 3-8



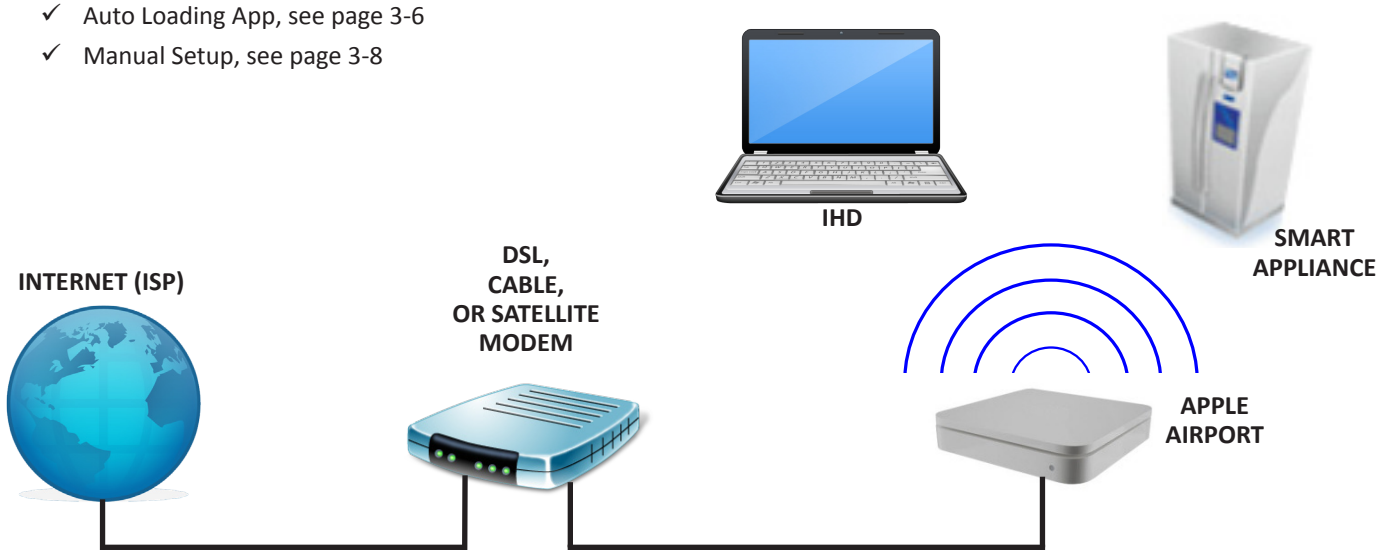
Wireless Configurations

Configuration 3 (Apple)

ISP → Modem → Apple Air Port → In Home Display (IHD) & Smart Appliance(s)

Suggested Provisioning Methods:

- ✓ Auto Loading App, see page 3-6
- ✓ Manual Setup, see page 3-8



Configuration 4 (Extender)

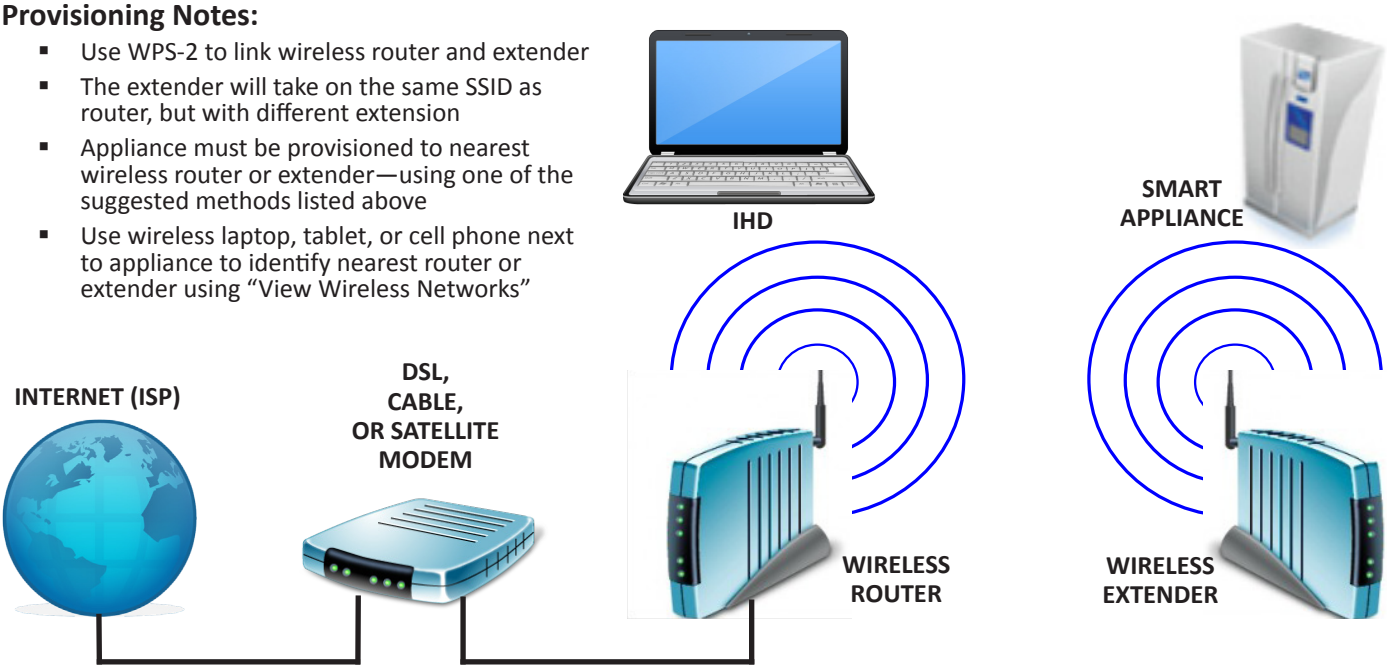
ISP → Modem → Wireless Router → Wireless Extender → In Home Display (IHD) & Smart Appliance(s)

Suggested Provisioning Methods:

- ✓ Push Button WPS, see page 3-7 (if wireless router supports WPS-2 - check manual)
- ✓ Auto Loading App, see page 3-6
- ✓ Manual Setup, see page 3-8

Provisioning Notes:

- Use WPS-2 to link wireless router and extender
- The extender will take on the same SSID as router, but with different extension
- Appliance must be provisioned to nearest wireless router or extender—using one of the suggested methods listed above
- Use wireless laptop, tablet, or cell phone next to appliance to identify nearest router or extender using "View Wireless Networks"



Create Online Account

System Requirements

NOTE: At the time of publication, the following list of system requirements is the minimum required to create an online account. Additional platforms and software versions may be added at a later date without prior notification.

Minimum System Requirements

- A computer connected to the home wireless network and the Internet.
- Browser Requirements:
  - Internet Explorer 9 or greater (PC)
  - Firefox 10 or greater (PC & Mac)
  - Safari 5.1 or greater (PC & Mac)
  - Chrome 17 or greater (PC & Mac)
- PC Requirements
  - Windows OS, 32 or 64 bit
  - Windows XP, SP3
  - Vista, SP2 or greater
  - Windows 7, SP1 or greater
  - Windows 8
- iPhone Requirements
  - iPhone 4s or newer
  - iOS version 5 or greater
- iPad Requirements
  - iPad 1 or newer
  - iOS version 5.1 or greater

SETUP SUMMARY:

- Go to mysmartappliances.com.
- Create Account User Name & Password
- Verify your Email Account
- Setup your location and utility company
- Download your App and/or register your appliances

Setup Procedure:

1. Go to mysmartappliances.com and select "SIGN UP." See figure 1.

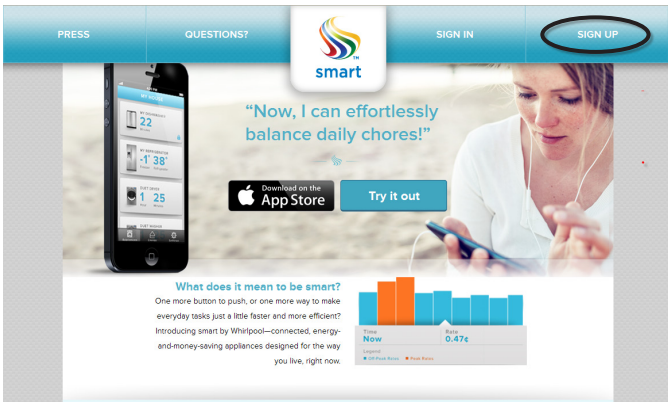


Figure 1

2. **Create Account (1)**: Fill out the requested information: Name, Email, and Password to access your account. Click the check box to agree to the Terms and Conditions and Privacy Statement. Select "Continue" when finished.

   NOTE: Click on the text "Terms and Conditions" and "Privacy Statement" to view documents.

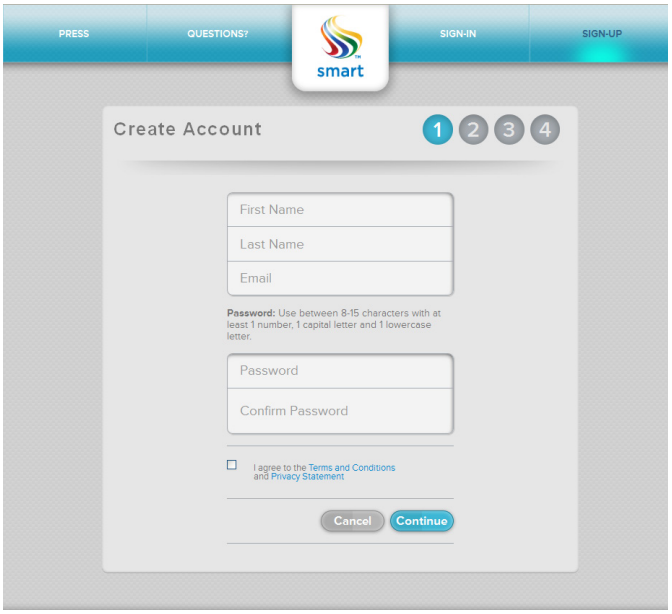


Figure 1

3. You will be asked to verify your account. A link will be sent to the email address you entered. Click on the link to verify your account.

   After your email has been verified, you can continue to create your account.

Create Online Account (continued)

4. **Create Home (2)**: Organize the Smart Appliances by location and associate each one with a home. Give your location a name, fill in the vital stats, and then select "Continue." See figure 3.

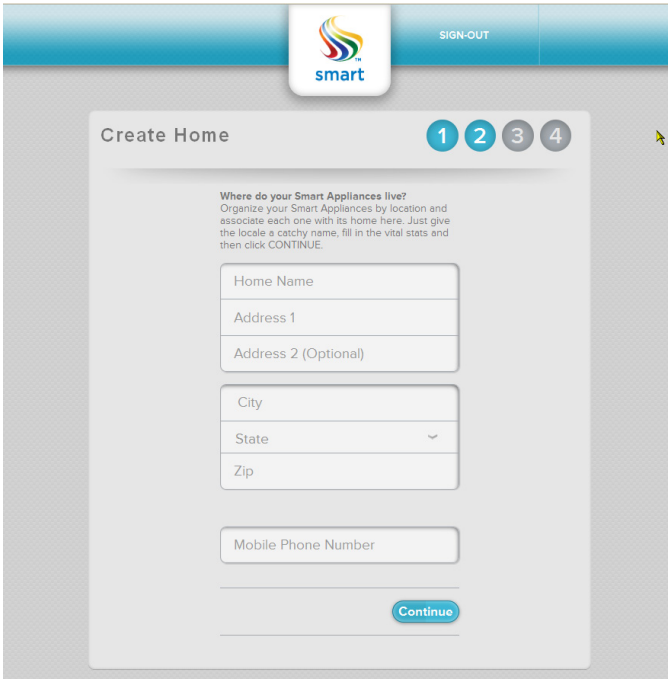


Figure 3

5. **Create Home (3)**: For the consumer to make informed decisions on energy usage, Energy Advisor must be switched "ON" (default setting). Click on the drop-down box and select the home utility company. Select "Continue" when finished.

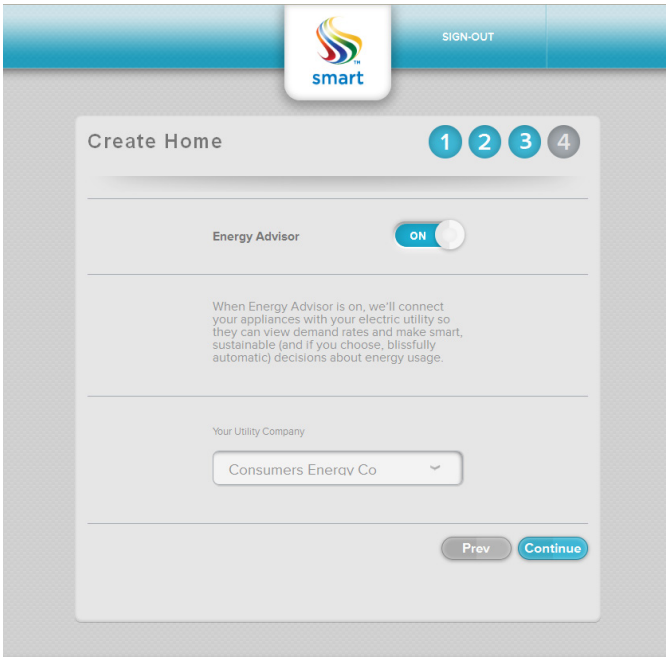


Figure 4

5. **Create Home (4)**: Download your App and/or register your appliances. Follow the steps in the Smart Start Guide to get your Smart Appliance to talk with your wireless network.

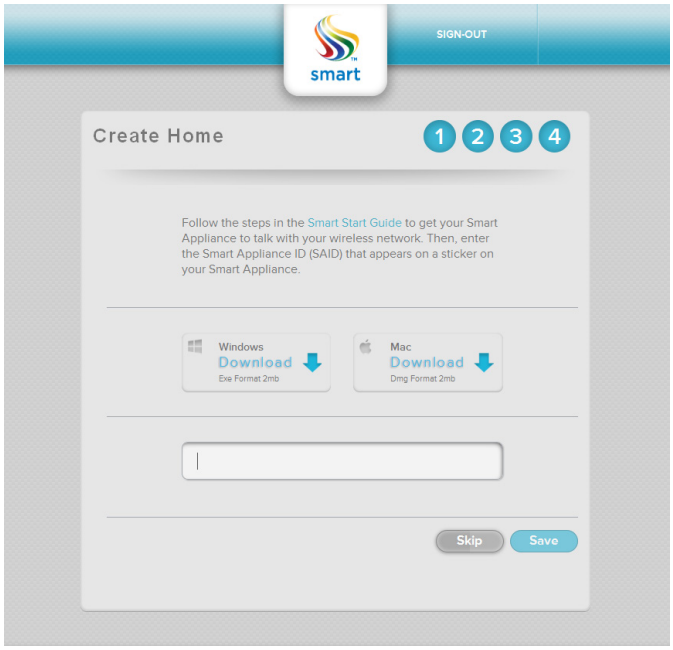


Figure 5

Setup & Provisioning Appliance

Provisioning Methods

There are currently three possible methods for provisioning an appliance with the Home Area Network (HAN) wireless router. In order of priority, these are:

- **Auto-loading App** – downloadable application that directs the user through the provisioning process.

- **WPS (Wi-Fi® Protected Setup)** - the user simply pushes a button, either an actual or virtual one, on both the Wireless Router and the Smart Appliance. Support of this mode is mandatory for the router and optional for connecting devices.

  NOTE: Router must support the WPS-2 standard.

- **Manual Setup**: SSID/Passphrase Method – the user enters the SSID and Passphrase of the Router into the Smart Appliance.

Before you begin:

MAKE SURE

- Verify Smart Appliance is properly installed and connected to power.
- Verify wireless router is turned on and connected to Internet.

Determine which of the three connection setup methods (below) to use:

- Many wireless routers support a standard for fast and easy connection to wireless devices. Officially know as Wi-Fi® Protected Setup (WPS). It features a connection button and indicator light. If the customer's router is like this and supports the WPS-2 standard, follow the preferred "WPS Setup" procedure.

  NOTE: To verify if router is WPS-2, check the product labeling or manual.
- If customer's wireless router does not support WPS-2, follow the "Auto-Loading App" or "Manual Setup" instructions.

Auto-Loading App Method

TOOLS REQUIRED:

No special tools required

SETUP REQUIREMENTS:

- A computer connected to the home wireless network and the Internet.
- The "Smart Appliance ID" (SAID), which is printed on a sticker inside the door of your appliance or on the edge of the door.

SETUP SUMMARY:

- Go to mysmartappliances.com and download wireless setup utility app.
- Accept the terms and conditions agreement.
- Enter your Smart Appliance's 10 character Smart Appliance ID number (SAID) number, which is printed on a sticker inside or on the edge of the door of your appliance and click connect.
- Once successfully connected to the Network click on "Register Online" button or go to mysmartappliances.com to setup your account and claim the appliances.

SETUP PROCEDURE:

1. Go to mysmartappliances.com and "SIGN-IN." Select "SETTINGS" at the top of the page and then select "Add Appliance." From this page you can download either the Windows or Mac Setup Utility.
2. Launch the setup utility. The following screen should appear (see figure 6).

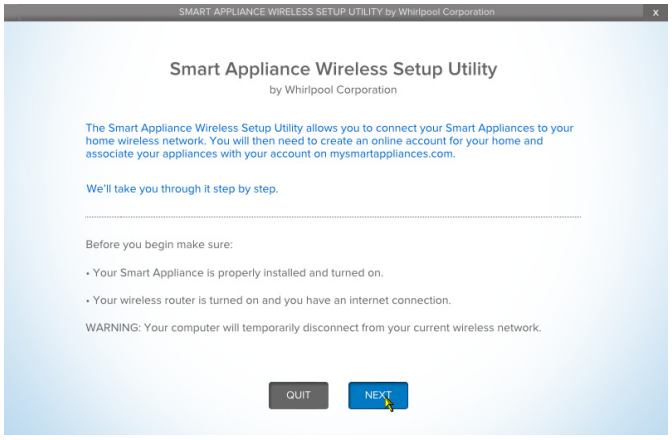


Figure 6

3. Make sure that the appliance is properly installed and connected to power. Select "Next" to continue.

Setup & Provisioning Appliance (continued)

4. Enter the Router Password (password is case sensitive) for the wireless network that you want your appliance to use. Then enter the Smart Appliance ID # from Tag located on product. (SAID# is case-sensitive.) See figure 7.
5. Select "Connect" when finished.

   NOTE: Only one appliance at a time can be connected. This process may take up to a minute to complete.

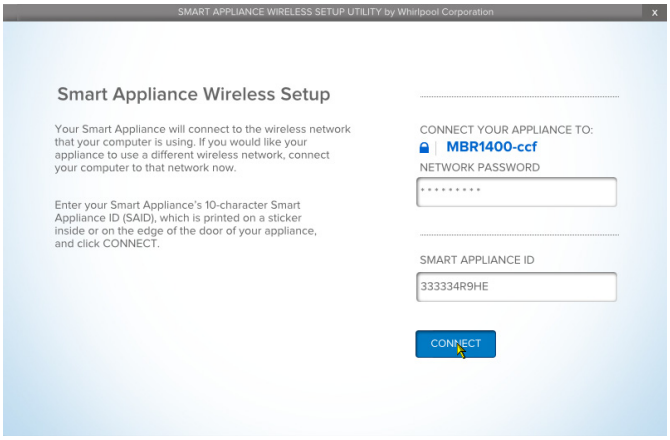


Figure 7

6. If the appliance and network information was entered correctly, the following screen (see figure 8) should indicate that the Smart Appliance has been successfully connected to the Network.

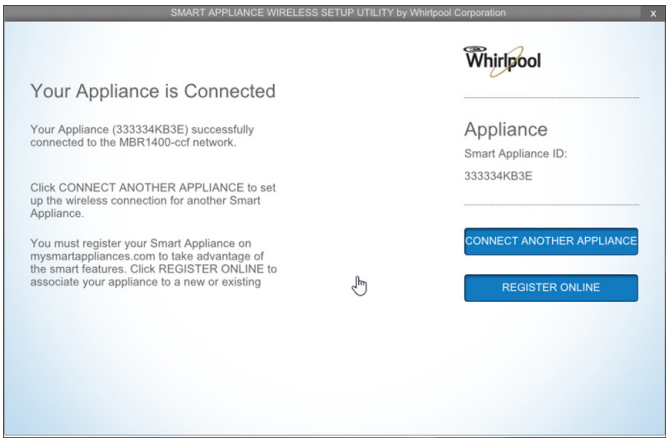


Figure 8

7. Select the "Connect Another Appliance" button to setup the wireless connection for another Smart Appliance. If done, select the "Register Online" button, or go to mysmartappliances.com. The customer will need to setup their account and claim the appliances to take advantage of the smart features.

WPS Setup Method

TOOLS REQUIRED:

No special tools required

SETUP REQUIREMENTS:

- A computer connected to the Internet.
- A wireless router that supports the WPS-2 standard. If necessary, consult the user manual that came with the router to verify.

SETUP PROCEDURE:

Ensure the Smart Appliance and Wireless Router are properly installed and powered on; an Internet connection is required.
NOTE: Only one Smart Appliance can be linked at a time.

IMPORTANT: complete the next 2 steps within 2 minutes!

1. On the wireless router, press the WPS (Wi-Fi® Protected Setup) button. See figure 9 (WPS button location may vary).

   NOTE: on some routers you may have to login to the router admin screen to enable the WPS button. An indicator light on the router will begin blinking. (If necessary, consult the user manual that came with the router for more information.)

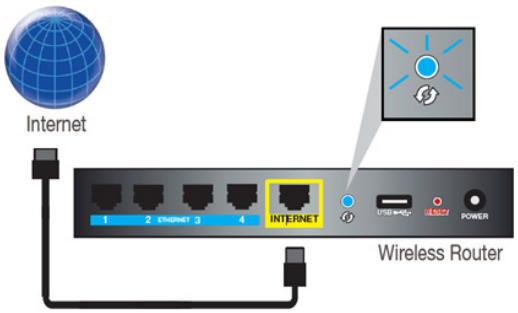


Figure 9 - Press WPS Button on Router

2. On the Smart Appliance, press the Smart Grid button.

   You may have to wake up the control panel by pushing another button first. The Smart Grid indicator light will blink while the appliance connects to the router. This can take up to 2 minutes. When appliance is connected to the router, the appliance will sound 3 short tones. After that, the Smart Grid indictor light may go out briefly, but when it comes back on, it will remain on solid.

   NOTE: If the appliance Smart Grid function is turned off, or the router loses Internet connection, the Smart Grid indicator light will turn off.
3. If there are other Smart Appliances, repeat steps 1 and 2 for each. Otherwise skip ahead to "REGISTERING YOUR APPLIANCES."

IF THE APPLIANCE DOES NOT CONNECT:

If the appliance and router fail to connect after 2 minutes elapses, the Smart Grid indicator light will blink rapidly for 5 seconds and then turn off. If this happens, read the "Troubleshooting Setup and Provisioning" section.

Setup & Provisioning Appliance (continued)

Manual Setup Method

TOOLS REQUIRED:

No special tools required

SETUP REQUIREMENTS:

- A computer connected to the home wireless network and to the Internet.
- The "Smart Appliance ID" (SAID), which is printed on a sticker inside the door of your appliance or on the edge of the door.
- The Smart Appliance's MAC Address, printed on the same sticker.
- The customer's home wireless network name (or SSID number) and password.

SETUP PROCEDURE:

Check to ensure the Smart Appliance and Wireless Router are properly installed and powered on; an Internet connection is required. **NOTE:** Only one Smart Appliance can be linked at a time.

1. On the computer, have the consumer access their home network wireless settings and view the list of available wireless networks (see figure 10). **NOTE:** The wireless network window may vary depending on program or OS.

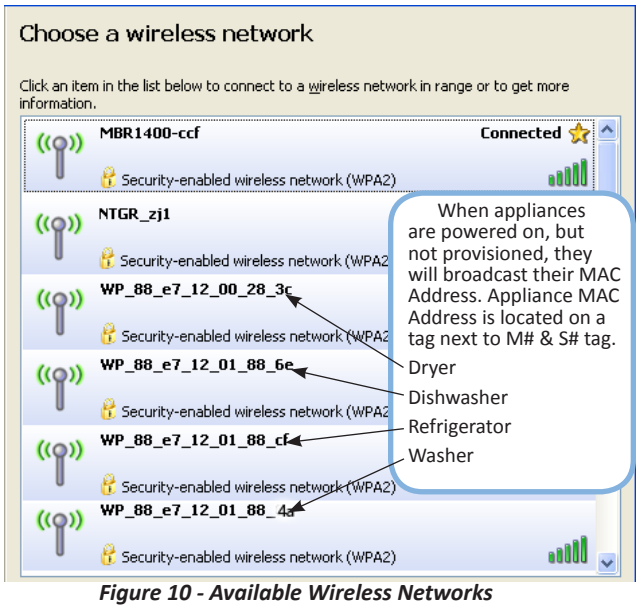


Figure 10 - Available Wireless Networks

2. Select the appliance from the list. It will be identified with the characters of the MAC ADDRESS but with different punctuation (ex. WP_88_E7_12_00_28_3C). Select "Connect." If the appliance is not listed, you may need to refresh the list of available wireless networks (Figure 11).

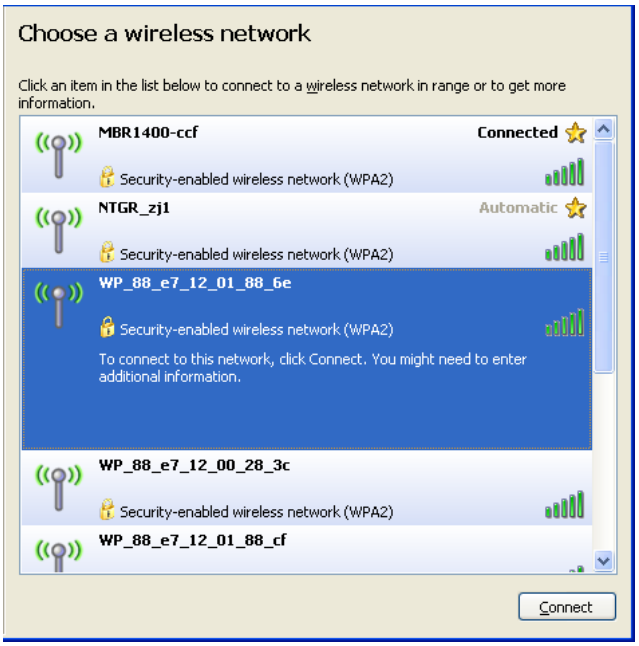


Figure 11

3. In the network/security key field (see figure 12), enter the SAID number, which is found next to the Serial/Model # tag, (something like 44444A123B). **IMPORTANT: this key is case sensitive.** Then, select the Next or Connect button to connect to the network.

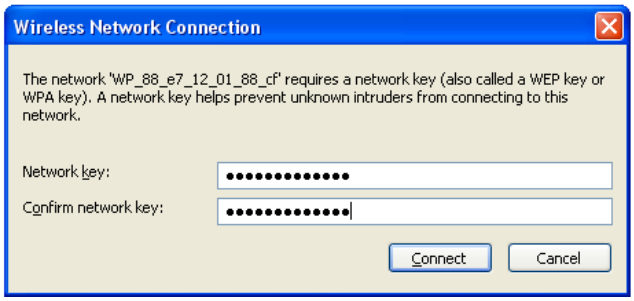


Figure 12

4. If nothing appears, open a web browser and type "192.168.10.1" in the address bar **(1)** and press "Enter" to view the "Smart" setup webpage (see figure 13). In the drop down list of available wireless networks **(2)**, select the name of customer's home wireless network. If the home wireless network is hidden, manually enter its name and security protocol **(3)**. If required, enter the passphrase for the home wireless network **(4)**, and then Submit.

Setup & Provisioning Appliance (continued)

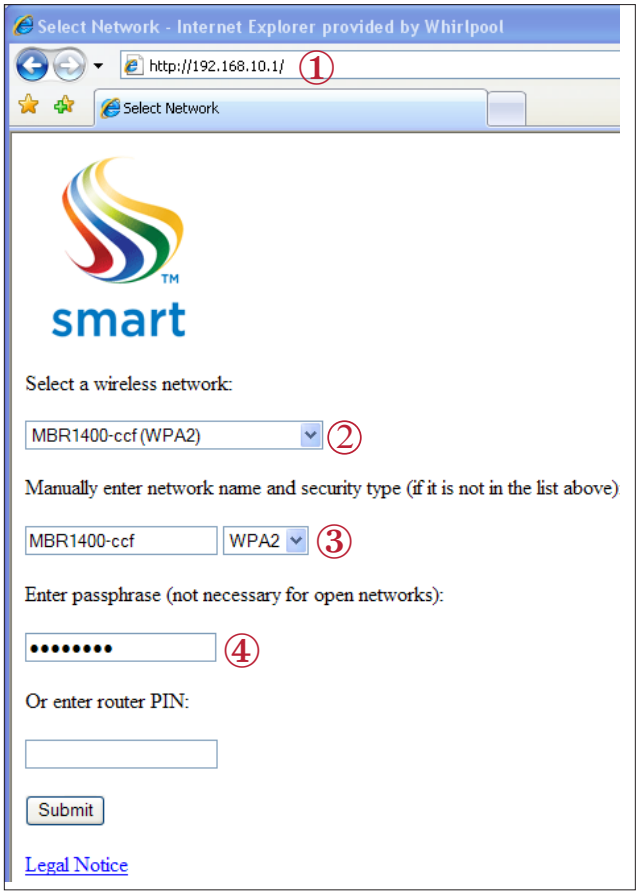


Figure 13

5. A new webpage will be displayed saying "Connecting to Network..." While connecting, the customer's wireless network will be temporarily disabled. If the connection is unsuccessful, it will appear again in their computer's list of wireless networks in a couple minutes so you can try again.
6. After successful connection, access wireless settings and re-open the list of available wireless networks. Check that the customer's computer is once again connected to the home wireless network. If it is not, select the home wireless network and Connect.

   NOTE: It may be necessary to "refresh" the list.
7. If there are other Smart Appliances, repeat steps 1 through 4 for each. Otherwise, proceed to "REGISTERING YOUR APPLIANCES."

IF THE APPLIANCE DOES NOT CONNECT:

If the appliance and router fail to connect after 2 minutes elapses, the Smart Grid indicator light will blink rapidly for 5 seconds and then turn off. If this happens, read the "Troubleshooting Setup and Provisioning" section.

Registering Your Appliances

The consumer must register their Smart Appliances in their account to take advantage of the smart features.

1. Visit mysmartappliances.com. If this is the first time visiting the website...create an account; otherwise, "SIGN-IN" with your user name and password.
2. Click on "SETTINGS" at the top of the screen and then select "Add Appliance" (see figure 14).

Figure 14

3. Enter the Smart Appliance ID number and then select "Save" (see figure 15).

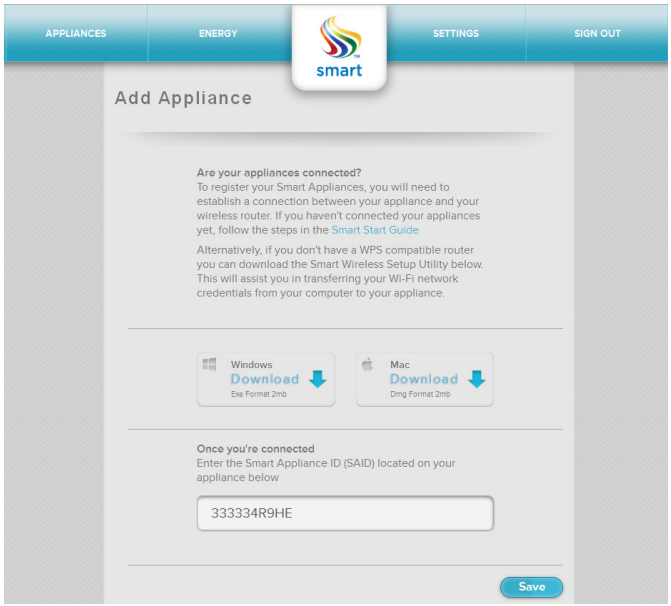


Figure 15

4. Connect any other Smart Appliances. If another Smart Appliance is to be connected, repeat the automatic or manual setup process to connect each appliance to the wireless router one at a time.

NOTE: Once the appliances have been linked to the wireless router, they will remain linked, even in the event of a power outage, moving, or extended storage. If the wireless router is replaced, the linking/provisioning process will need to be completed again.

Setup & Provisioning Appliance (continued)

Smart Appliance Screen

The Smart Appliance screen (F[1]igure 16) provides power usage, cycle monitoring, energy report, preferences (email and text alerts), literature, and the ability to remotely pause a cycle and purchase supplies. Additionally, it provides status for detergent, Affresh®, rinse aid, water filter, lint filter, and much more.

Setting Smart Preferences

Setting Email/Text Alerts

Select "Preferences" from the Smart Appliance screen. From the Appliance Preference screen, click on "Email," "Text," or both to set notification preferences. See figure 17.

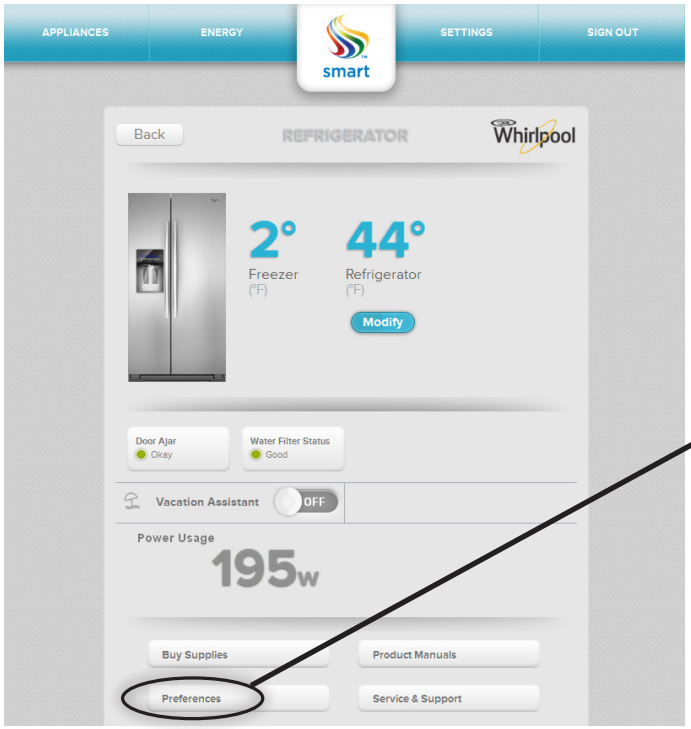


Figure 16

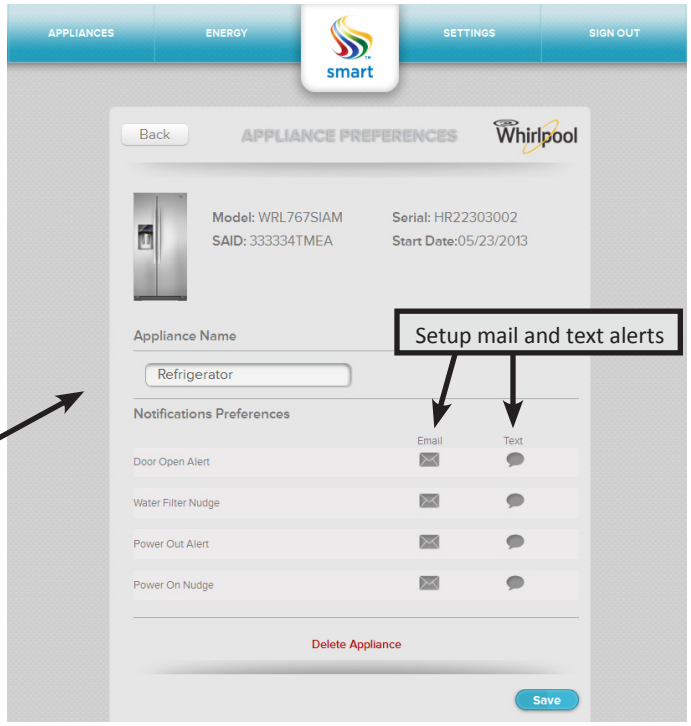


Figure 17

Troubleshooting Setup & Provisioning

SMART GRID LIGHTS BLINKING	
Complaint/Cause	**Check**
The Smart Grid indicator light is blinking slowly.	The appliance is in linking mode. The Smart Grid indicator light will blink twice per second for up to two minutes while the appliance attempts to establish a connection with the wireless router. Once a connection is established, the appliance will sound a "connected" tone, the indicator light may go out briefly, but then it should stay solidly lit.
Instead of hearing the "connected" tone, the Smart Grid indicator light blinks rapidly for 5 seconds after an attempt is made to link (provision) the appliance.	The appliance was unable to establish a connection with the wireless router using the WPS (Wi-Fi® Protected Setup) method. Check out the following: • WPS button on the wireless router was not pressed with 2 minutes of starting the linking process on the appliance. This may require two people to complete within the 2 minute time frame. • The wireless router MUST support the WPS-2 standard. Check the label on the router or the router manual to verify WPS-2 is supported. • You must complete the linking process for one appliance to the wireless router before beginning to line the next. • Is the wireless router and appliance too far away from each other or is something interfering with the signal (a microwave oven, fluorescent lights?). If possible, place the wireless router closer to the appliance or install a Wi-Fi® range extender. • There is interference from outside the home. Wait several minutes and try again. If possible, place the wireless router closer to the appliance or install a Wi-Fi® range extender. **NOTE:** The wireless router must be set to enable WPS provisioning. Verify the router is setup to broadcast its SSID, MAC filtering is disabled and that either WPA or WPA2 wireless security is enabled.

SMART GRID LIGHTS ARE OFF	
Complaint/Cause	**Check**
The appliance seems to have successfully linked, but the Smart Grid indicator light is off.	The Smart Grid feature is turned off or the appliance has lost connectivity with the Internet. First, the Smart Grid function can be disabled for the current cycle (or for up to 4 hours on refrigerators) by pressing the Smart Grid button on your appliance. Press the button again to reactivate the feature. If that doesn't work, check to be sure that the router is on and connected to the Internet.

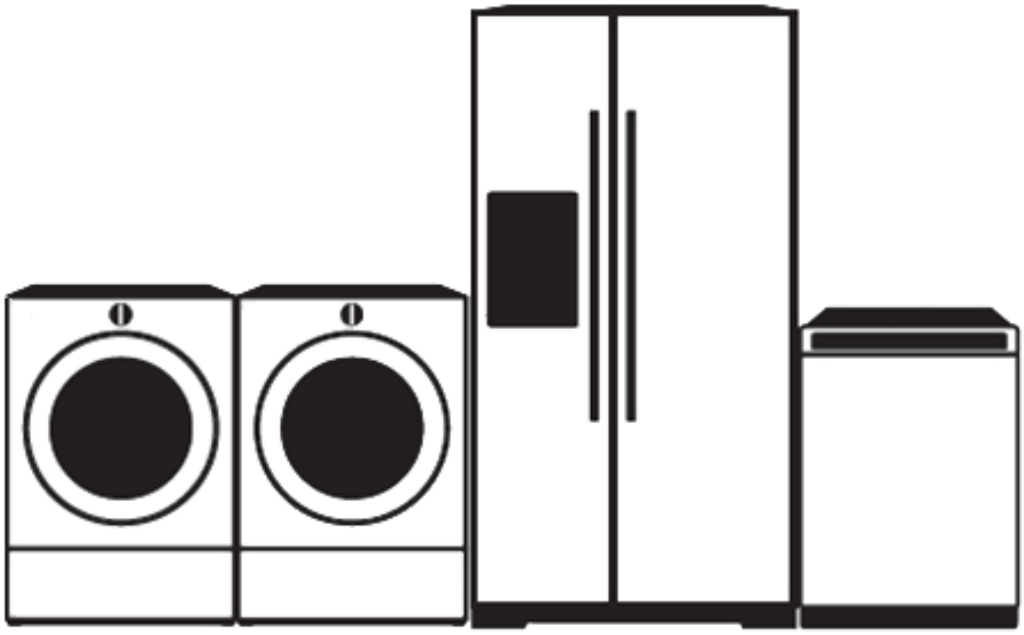
NO EMAIL / TEXT NOTIFICATION	
Complaint/Cause	**Check**
Unable to use Smart features or receive email or text notifications.	First, be sure that the wireless router is connected to the Internet and the Smart Grid indicator light is on. Then check these items: • User Account: The consumer must setup an account and register their appliance at mysmartappliances.com. Register the appliance by selecting "SETTINGS" at the top of the screen and then select "Add Appliance." • Be sure that the correct email or mobile number is saved on the user account page. • Notifications settings must be set ON to receive messages.

Notes

Section 4: Diagnostics & Troubleshooting

This section provides fault codes, diagnostic, and troubleshooting information for the "6th Sense Live – Connected Smart Appliances."

- Theory of Operation
- Smart Appliance Components
- Error Codes (All Product Categories)
- Troubleshooting Guide
- Component Testing
- Fault Codes with Test Procedures
- Replacement Procedures
- Troubleshooting Network Connectivity
- Notes



CONNECTED SMART APPLIANCES

For Service Technician Use Only

Theory of Operation

External Communication Module (ECM)

The ECM (External Communication Module), Current Transformer, and Wi-Fi® Antennas are a common cross-platform design. The ECM provides the interface between the Smart Appliance and the Internet. It communicates to the Appliance Control Unit (ACU) using Reveal/WIDE (Whirlpool Integrated Service Environment) protocol and to the Internet using 802.11n Wi-Fi®.

AC/DC Switch Mode Power Supply (SMPS)

The ECM is required to have AC/DC power conversion to provide the necessary voltages to the ECM power measurement, radio, and communication modules. A switch-mode power supply (SMPS) is used to maximize efficiency and incorporate safety protection. Line (L1), Neutral, and L2 (dryer only) enters the ECM at connector J3; pins 1, pin 3, and pin 5 respectively.

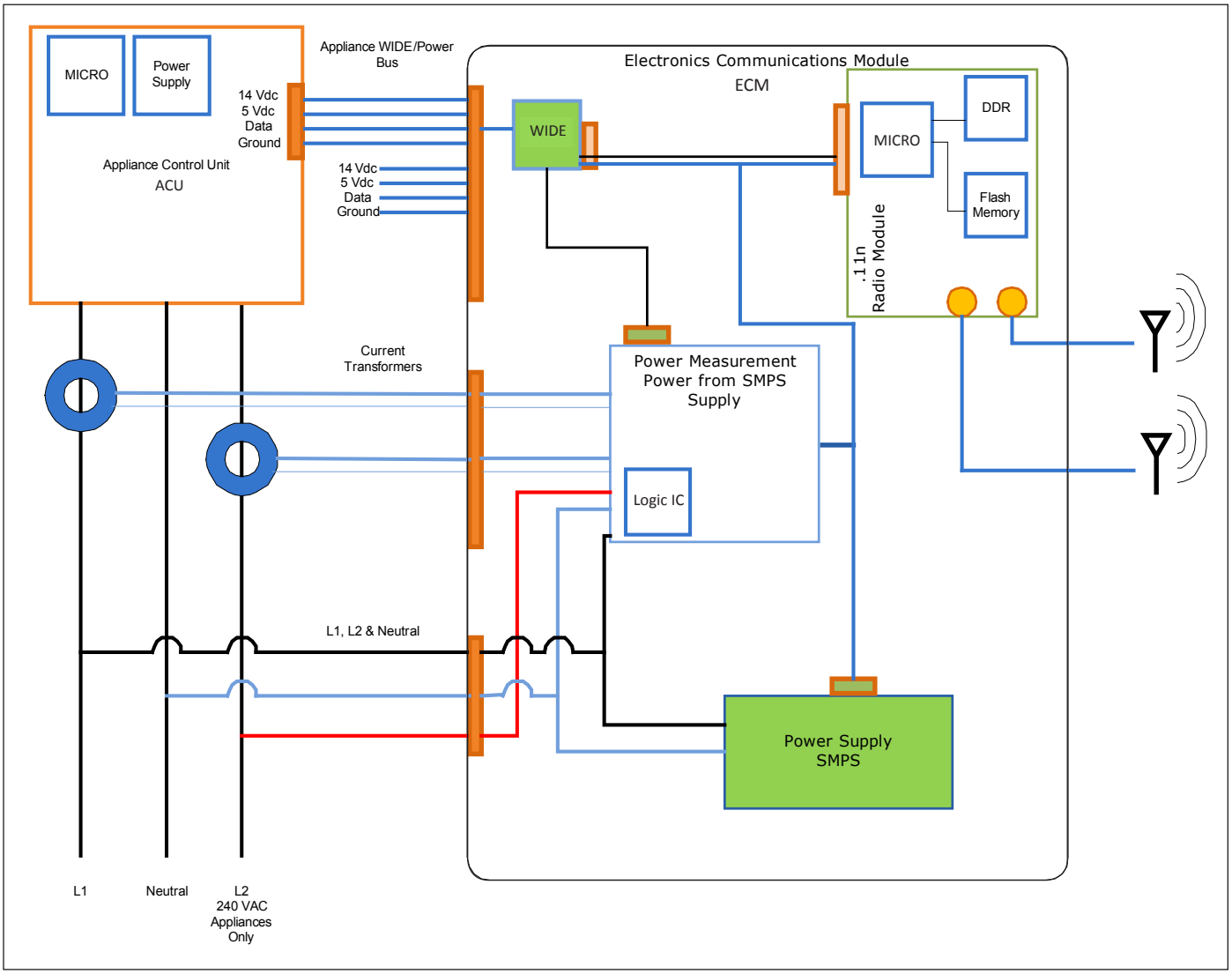


Figure 1 - ECM Block Diagram

For Service Technician Use Only

Power Measurement Circuit and Current Transformer(s)

The ECM performs actual power measurement; calculating both real power (kW) as well as real power/time (kW h). Current is measured using current transformer(s). Current Transformer 1 (CT1) will monitor L1 and Current Transformer 2 (CT 2) will monitor L2 (electric dryers).

The output of the Current Transformer(s) is connected to the ECM at connector J12, pins 1 & 2 (CT1) and if L2 exists, pins 3 & 4 (CT2).

Wi-Fi® Radio Module (802.11n) with Front and Rear Antennas

The transceiver is 802.11n compliant and supports switched antenna TX/RX diversity. Each appliance has two antennas, one located on the front and one on the back of the appliance creating spatial diversity. The ECM has the ability to select the best antenna based on signal to noise ratio and performs this optimization during provisioning and after linking to a Wireless Router; no antenna should be dominant.

The Front Antenna enters the ECM at connector J2 (RF Port A). The Rear Antenna enters the ECM at connector J11 (RF Port B).

Smart Appliance Components

External Communications Module (ECM)

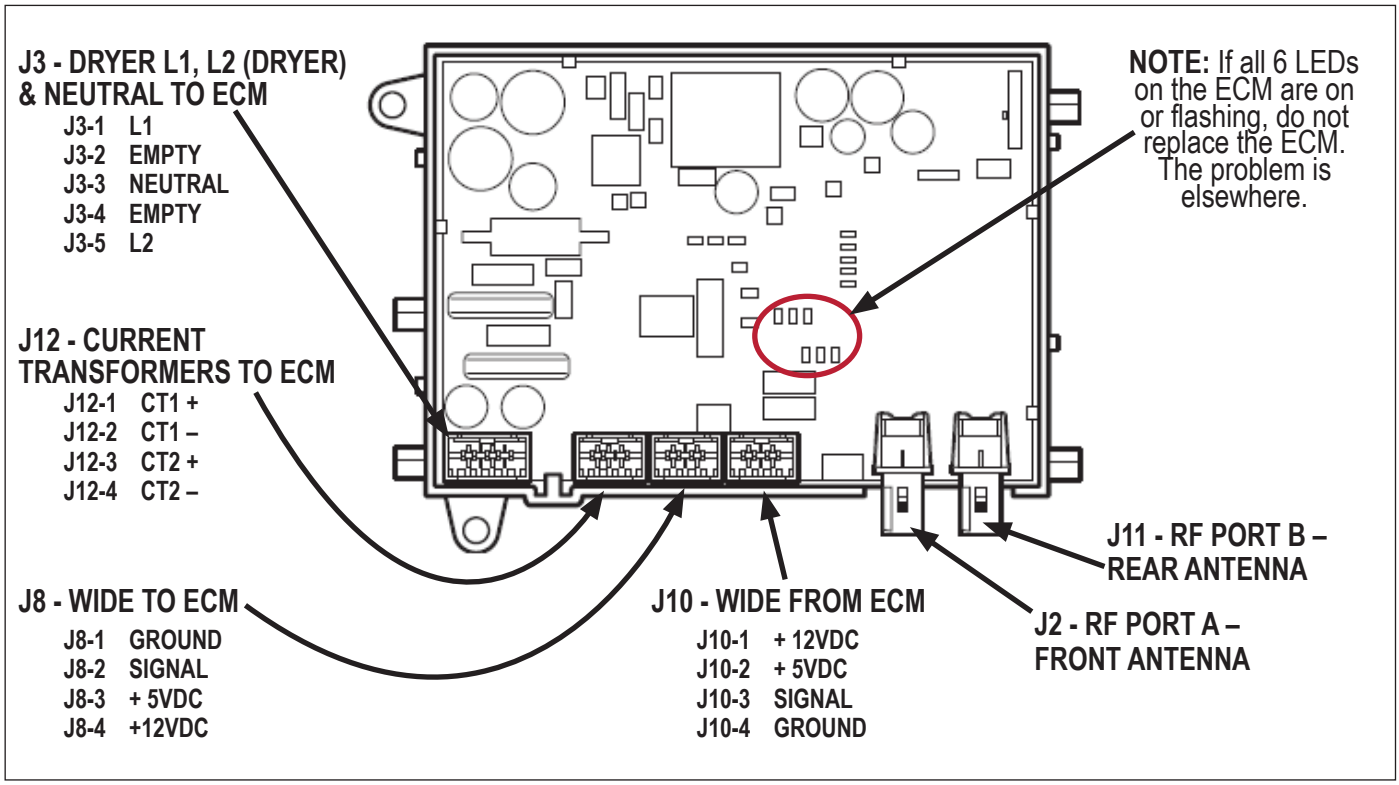
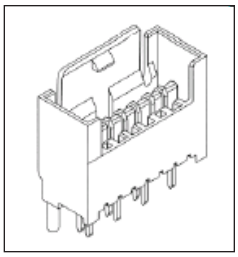


Figure 2 - ECM Board Layout

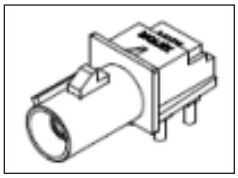
For Service Technician Use Only

ECM Connectors and Pin-outs

Connector Number	Connected Components	Pin Numbers	Connector Type
J3	Appliance L1, L2 (Dryers) & Neutral to ECM	1: L1	RAST 2.5
		2: Empty	
		3: Neutral	
		4: Empty	
		5: L2	
J12	Current Transformers to ECM	1: CT1 +	RAST 2.5
		2: CT1 -	
		3: CT2 +	
		4: CT2 -	
J8	WIDE to ECM	1: Ground	RAST 2.5
		2: Signal	
		3: +5V DC	
		4: +12V DC	
J10	WIDE from ECM	1: +12VDC	RAST 2.5
		2: +5VDC	
		3: Signal	
		4: Ground	
J2	RF Port A - Front Antenna	Coax	FAKRA
J11	RF Port B - Rear Antenna	Coax	FAKRA



RAST 2.5
PCB Connector



FAKRA
PCB Connector

ECM LED's

Six LEDs are located on the ECM to aid a service technician. Three LEDs are for the WIDE side (communication between the ECM and ACU) and three LEDs are for the Wi-Fi® side (communication between the ECM and Wireless Router). See pages 4-12 and 4-13.

Current Transformer (CT) (See figure 3 at right)

- Acts like an amp probe on L1 to measures entire machine current such that actual power can be calculated.
- Electric dryers have two current transformers, L1 and L2.
- Current Transformers are integrated into the appliance wiring harness on all models.

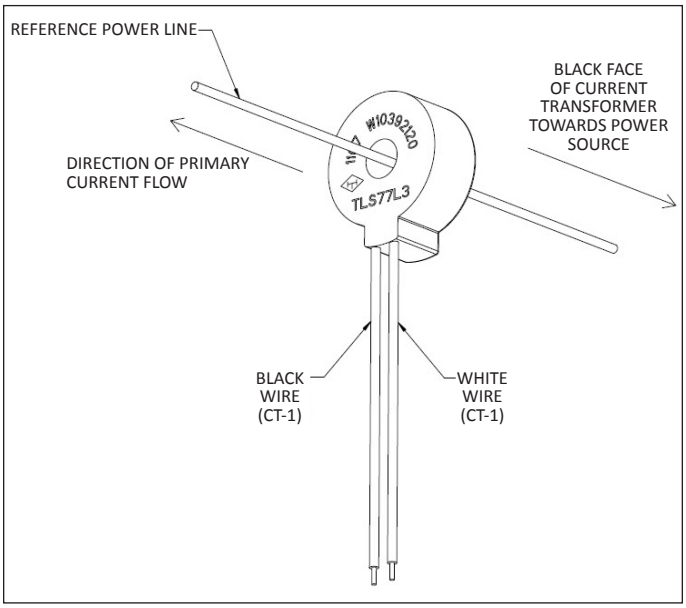


Figure 3 - Current Transformer

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Smart Appliance Antennas

Two antennas are located on the appliance

- One near the rear of the unit
- One towards the front of the unit

Typical antenna assembly shown in figure 4

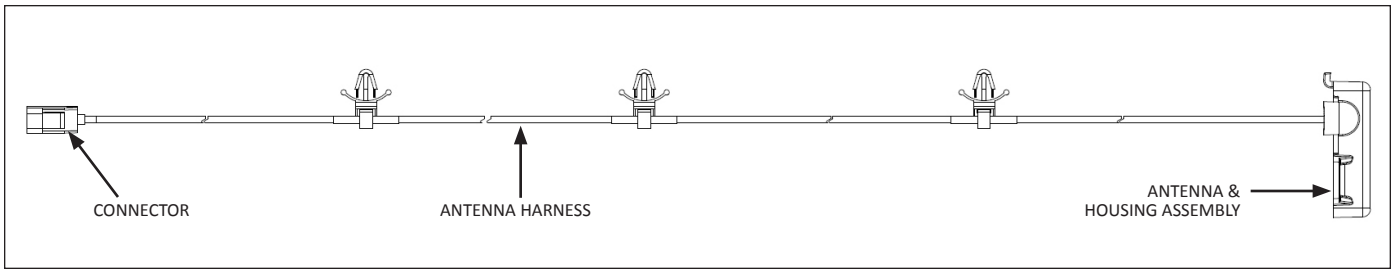

Figure 4 - Typical Antenna Assembly

Smart User Interface

- Varies across product categories and models
- Smart Grid button provides Override feature
- Delay key adds Smart Delay as an option in addition to 4 hour delay
- A bi-color Energy status LED is added to represent the Grid Status on dishwashers.
  - Green = Off-peak pricing
  - Amber = Peak pricing (Smart Grid Mode 1)
  - Blinking Amber = Grid Event (Smart Grid Mode 2)

Figure 5

Appliance Control Unit (ACU)

Also, known as Control Board, Control, Main Control, CCU, Central Control Unit, Cycle Control Unit, Minotaur, etc.

- Varies across product categories and models
- The electronic control that manages the appliance's loads and in some cases, the user interface.

⚠ WARNING

Electrical Shock Hazard

Disconnect power before servicing.

Replace all parts and panels before operating.

Failure to do so can result in death or electrical shock.

Error Codes (All Product Categories)

SMART APPLIANCES			ERROR CODES							
			Dishwasher		Refrigeration		Dryer		Washer	
Problem Failure	Cause	Check	Function	Problem	Function	Problem	Function	Problem	Function	Problem
No communication between ECM and Control	▪ Loose connection in ECM or Control ▪ Communication bus or loose connection on ECM L1/N	1. Unplug appliance or disconnect power and check all connections to ECM. 2. Remove cover on ECM, restore power and visually inspect and verify that the LEDs D30 – D32 are on or flashing. If not, power off the unit and replace the ECM. If the LEDs are on and flashing, then power off the unit, reinstall the ECM cover and continue checking other components (the ECM is working properly. Problem is elsewhere).	12	1	PASS / FAIL		FC	E0	FC	E0
No link between ECM and Wireless Router	▪ Appliance not linked to wireless router	Press and hold Smart Grid button for 20 seconds, press WPS button on wireless router and press and release the Smart Grid button within 2 minutes.	12	2	PASS / FAIL		FC	E1	FC	E1
No link between ECM and Internet	▪ The appliance is not receiving signal from the wireless router.	Press the Smart Grid button; if an error tone sounds, check to be sure the router is on and connected to the Internet.	12	3	PASS / FAIL		FC	E2	FC	E2
Antenna A problem	▪ Loose connection in Antenna A circuit	Unplug appliance or disconnect power and check all connections in Antenna A circuit. Fix/replace Antenna A.	12	4	PASS / FAIL		FC	E3	FC	E3
Antenna B problem	▪ Loose connection in Antenna B circuit	Unplug appliance or disconnect power and check all connections in Antenna B circuit. Fix/replace Antenna B.	12	5	PASS / FAIL		FC	E4	FC	E4
Current Transformer A problem	▪ Loose connection in Current Transformer A circuit	Unplug appliance or disconnect power and check all connections in Current Transformer A circuit. Fix/replace Current Transformer.	12	6	PASS / FAIL		FC	E5	FC	E5
Current Transformer B problem	▪ Loose connection in Current Transformer B circuit	Unplug appliance or disconnect power and check all connections in Current Transformer B circuit. Fix/replace Current Transformer.	NA	NA	NA		FC	E6	NA	NA
Provisioning problem	▪ A timeout occurs, multiple responses from wireless router, or message failures during linking process.	Check the following: 1. WPS Button on the wireless router was not pressed within 2 minutes of starting the linking mode on the appliance. This may require two people to complete within the 2-minute time frame. 2. The wireless router must be set to enable WPS provisioning. Verify the router is setup to broadcast its SSID, MAC filtering is disabled and that either WPA or WPA2 wireless security is enabled. 3. You must complete the linking process for one appliance before beginning to link the next. 4. The wireless router is too far away from the appliance, or there is too much interference (microwave oven, fluorescent lights, etc.) between the router and appliance. If possible, place the wireless router closer.	12	7	PASS / FAIL		FC	E7	FC	E7

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Troubleshooting Guide

ISSUE WITH WHIRLPOOL SMART APPLIANCE USER ACCOUNT	
Complaint/Cause	**Check**
How to get connected once Smart Appliances are installed.	For full Smart Grid functionality, the appliance must be connected to the home wireless network through a wireless router (sold separately) and the customer must have an active Internet connection. Refer to "Section 3 – Setup & Provisioning" for more information on how to get connected. Once you have completed the setup process for the appliance(s), the Smart Grid function will default to On (Smart Grid indicator is lit) as long as it is communicating with the router.
Consumer does not know where to go to setup their account.	The consumer must be able to connect to the Internet and go to mysmartappliances.com to create their Smart Appliance user account.
User Account application is not loading.	Is there a conflict with browser application type/revision? Cookies? Pop-up blocker? Refer consumer to ISP if they cannot access the Internet.
Forgot user name or password.	Click on Forgot User Name and Password and follow instructions to retrieve user name or password.
UNABLE TO PROVISION APPLIANCE TO ROUTER	
Complaint/Cause	**Check**
Smart Grid indicator on Smart Appliance is blinking slowly.	The appliance is in linking mode (provisioning). The indicator light will blink slowly for up to two minutes while the appliance attempts to establish a connection with the wireless router. Once a connection is established, the indicator light will stay on.
Not able to provision Smart Appliance.	1. Did the consumer go Online and setup their User Account at mysmartappliances.com? If not, send to mysmartappliances.com. 2. Is this the first connected appliance or does the consumer have others? If this is the first appliance, review provisioning instructions. If provisioned, call rep should see the appliance in WISE. 3. Is the consumer connected to the Internet after installing router—can they access the Internet on their home computer (Google.com)? If yes, try to provision appliance again. 4. Does the consumer have a wireless router—can they use mobile Wi-Fi® devices in their home to access the Internet (Google.com on laptop)? 5. Does the consumer have the correct wireless router? If using the WPS method, the wireless router must support the WPS-2 standard. 6. If using the WPS method, did the consumer push the WPS button of wireless router first, and then the appliance within two minutes? Is WPS enabled on the router? 7. Does the consumer have the wireless router security enabled? When the consumer setup their router, did they pick a security code - if not, refer them to their router's user instructions and have them setup their security code. **IMPORTANT:** Changing the security code could disable all Internet connections. 8. Is the customer's computer/laptop/tablet Wi-Fi® Security setup to match their router? If not, verify the security code for their computer/laptop/tablet is set to their wireless router and not the neighbors. 9. Do they have a laptop, tablet, or other mobile device - can they use this for range testing? 10. Can the consumer take their laptop, tablet, or other mobile device to where the appliance is - to see that it can still communicate at this range from their router. 11. Can the laptop, tablet, or other mobile device still talk to the Internet (google.com)? Go to a new website to test for connectivity (not a recent page that may have been cached on their browser)?

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Troubleshooting Guide (continued)

UNABLE TO PROVISION APPLIANCE TO ROUTER (Continued)	
Complaint/Cause	**Check**
Not able to provision Smart Appliance.	12. Go to the "Wireless Network Status" typically on the Windows PC Task Bar or My Network Connection. Right Click on Wireless Network Status - and check how many bars are present 13. If laptop, tablet, or other mobile device cannot communicate at this range, can it communicate moving closer to the router? 14. Can you move the wireless router closer to the appliance by lengthening the wire between the router and the Cable, Satellite, or DSL modem box? 15. If a Wi-Fi® extender is needed, it should be positioned halfway between the Smart Appliance and the wireless router. Refer to "Section 3 - Setup & Provisioning."
Smart Grid indicator turns off when attempting to link the Smart Appliance	The appliance was unable to establish a connection with the wireless router. Check the following: 1. WPS button on the appliance was not pressed within two minutes of starting the linking mode on the wireless router. This may require two people to complete within the two minute time frame. 2. The process must be completed for linking one appliance to the wireless router before starting the process on the next appliance. 3. The wireless router is too far away from the appliance, or there is too much interference (microwave oven, fluorescent lights, etc.) between the router and the appliance. If possible, place the wireless router closer to the appliance or install a Wi-Fi® range extender. 4. Interference from outside the home. Wait several minutes and retry. If possible, place the wireless router closer to the appliance or install a Wi-Fi® range extender.
Appliance has been successfully linked but Smart Grid indicator light is off.	1. Smart Grid feature is off. The Smart Grid function can be turned off for the current cycle by pressing the Smart Grid button briefly. Press Smart Grid button again to reactivate Smart Grid features. 2. The appliance is not receiving a signal from the wireless router. Press the Smart Grid button; if an error tone sounds, check that the router is on and connected to the Internet. 3. When the appliance goes into Standby Mode, the light will be off.
Unable to use advanced Smart Features or not receiving e-mail/text notifications.	Be sure that the wireless router is connected to the Internet. 1. User Account must be setup and appliance must be registered under "Add Appliance" on the customer's User Account page. 2. Be sure that the customer has the correct e-mail or mobile number saved on their Smart page and that their notifications are set to ON.
Primary Smart Grid features not working.	The utility company has not been specified in the User Account
ENERGY ADVISOR NO LONGER WORKING	
Complaint/Cause	**Check**
Not receiving alerts or able to participate in Energy Advisor.	Customer's profile is not set up to use Energy Advisor. Look up their account on the Website to verify Energy Advisor is enabled.
Someone unintentionally un-provisioned the Smart Appliance.	Customer turned off Smart Grid on the appliance. Review with customer on how to reactivate. Refer to "Section 3 - Setup & Provisioning."
Lost Internet service.	Internet service not working – have consumer call Internet Service Provider (ISP).
Power loss/interruption.	Power loss to home modem/wireless router. Recycle power or power on. Smart Grid LED light should come back on after modem, router, and re-connection to back-end has been re-established.

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Troubleshooting Guide (continued)

ENERGY ADVISOR FEATURE NO LONGER WORKING (continued)	
Complaint/Cause	**Check**
Lost link from Smart Appliance to wireless router.	Link between appliance and router is no longer established–Smart Grid light off continuously. Refer to "Unable to Provision Appliance to Router."
	Appliance and router are no longer communicating - refer to "Unable to Provision Appliance to Router."
ENERGY ADVISOR FEATURE NO LONGER WORKING	
Complaint/Cause	**Check**
Someone unintentionally turned off Smart Grid on the appliance.	Look for Smart Grid LED on appliance - if OFF, refer to "Unable to Provision Appliance to Router." Verify that their wireless router is connected to the Internet. Also confirm that the consumer has their correct e-mail or mobile number saved on their Smart page and that their notifications are set to ON.
Out dated version of application.	Is the appliance running the latest version of the application?
Disabled Energy Advisor in user account.	Make sure the customer hasn't disabled Energy Advisor in their user account
ECM IS UNABLE TO UPDATE ITS FIRMWARE	
Complaint/Cause	**Check**
ECM is unable to update its firmware.	The call rep should be able to see each appliance highlighted or grayed-out if not connected. The call rep will be able to see what the customer sees and access the help or detail screens to assist the customer if needed.
FAULT CODES ARE NOT AVAILABLE ON REMOTE APPLICATION	
Complaint/Cause	**Check**
Disabled notifications in user account.	Look for Smart Grid LED on appliance - if OFF, refer to "Unable to Provision Appliance to Router." Verify that their wireless router is connected to the Internet. Also confirm that the consumer has their correct e-mail or mobile number saved on their Smart page and that their notifications are set to ON.
Out dated version of SG application.	Is the appliance running the latest version of the application?
REMOTE APP NO LONGER DISPLAYS ODOMETER, CYCLE, ACCESSORY, OR STATUS NOTIFICATIONS	
Complaint/Cause	**Check**
Remote apps not longer display information from their Smart Appliance.	Look for Smart Grid LED on appliance - if OFF, refer to "Unable to Provision Appliance to Router." Verify that their wireless router is connected to the Internet. Also confirm that the consumer has their correct e-mail or mobile number saved on their Smart page and that their notifications are set to ON.
Out dated version of SG application.	Is the appliance running the latest version of the application?
UNABLE TO REMOTELY CONFIGURE CYCLE OR FEATURES OF THE SMART APPLIANCE	
Complaint/Cause	**Check**
Not able to remote access their Smart Appliances.	Look for Smart Grid LED on appliance - if OFF, refer to "Unable to Provision Appliance to Router." Verify that their wireless router is connected to the Internet. Also confirm that the consumer has their correct e-mail or mobile number saved on their Smart page and that their notifications are set to ON.
Out dated version of SG application.	Is the appliance running the latest version of the application?

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Troubleshooting Guide (continued)

SMART GRID LIGHTS BLINKING	
Complaint/Cause	**Check**
The Smart Grid indicator light is blinking slowly.	The appliance is in linking mode. The Smart Grid indicator light will blink twice per second for up to two minutes while the appliance attempts to establish a connection with your wireless router. Once a connection is established, the appliance will sound a "connected" tone, the indicator light may go out briefly, but then it should stay solidly lit.
Instead of hearing the "connected" tone, the Smart Grid indicator light blinks rapidly for 5 seconds when an attempt is made to link (provision) the appliance.	The appliance was unable to establish a connection with the wireless router using the WPS (Wi-Fi® Protected Setup) method. Check out the following: • WPS button on the wireless router was not pressed with 2 minutes of starting the linking process on the appliance. This may require two people to complete within the 2 minute time frame. • The wireless router MUST support the WPS-2 standard. Check the label on the router or the router manual to verify WPS-2 is supported. • You must complete the linking process for one appliance to the wireless router before beginning to line the next. • Is the wireless router and appliance too far away from each other or is something interfering with the signal (a microwave oven, fluorescent lights?). If possible, place the wireless router closer to the appliance or install a Wi-Fi® range extender. • There is interference from outside the home. Wait several minutes and try again. If possible, place the wireless router closer to the appliance or install a Wi-Fi® range extender. **NOTE:** The wireless router must be set to enable WPS provisioning. Verify the router is setup to broadcast its SSID, MAC filtering is disabled and that either WPA or WPA2 wireless security is enabled.
SMART GRID LIGHTS ARE OFF	
Complaint/Cause	**Check**
The appliance seems to have successfully linked, but the Smart Grid indicator light is off.	The Smart Grid feature is turned off or the appliance has lost connectivity with the Internet. First, the Smart Grid function can be disabled for the current cycle (or for up to 4 hours on refrigerators) by pressing the Smart Grid button on your appliance. Press the button again to reactivate the feature. If that doesn't work, check to be sure that the router is on and connected to the Internet.
NO EMAIL / TEXT NOTIFICATION	
Complaint/Cause	**Check**
Unable to use Smart features or receive email or text notifications.	First, be sure that the wireless router is connected to the Internet and the Smart Grid indicator light is on. Then check these items: • User Account: The consumer must setup an account and register their appliance at mysmartappliances.com. Register the appliance by selecting "SETTINGS" at the top of the screen and then select "Add Appliance." • Be sure that the correct email or mobile number is saved on the user account page. • Notifications settings must be set ON to receive messages.

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Component Testing

6th Sense / ECM - Strip Circuit

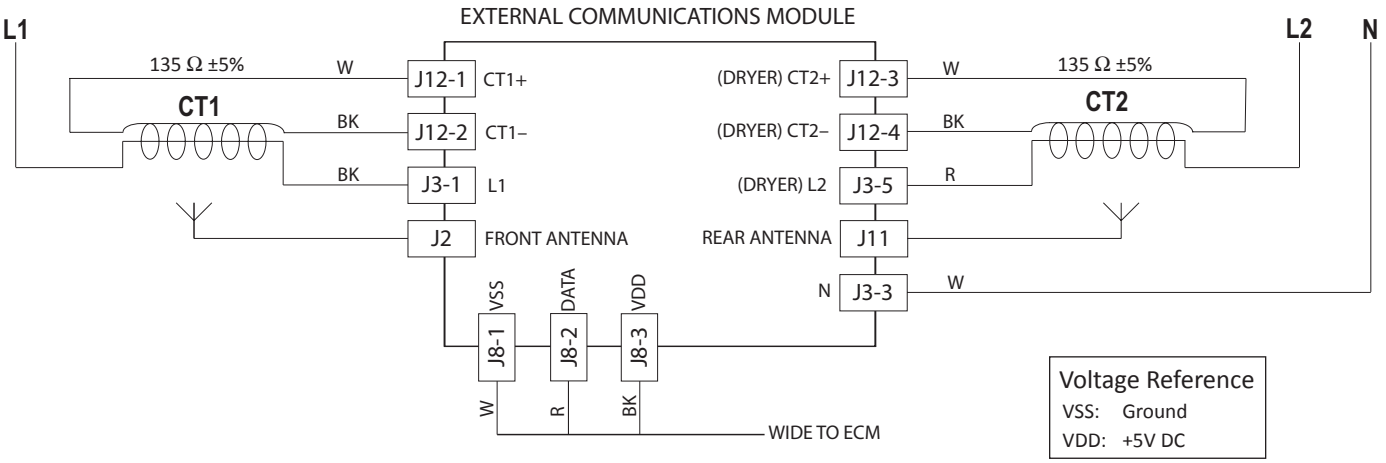

Figure 6 - 6th Sense / ECM - Strip Circuit

External Communications Module (ECM)

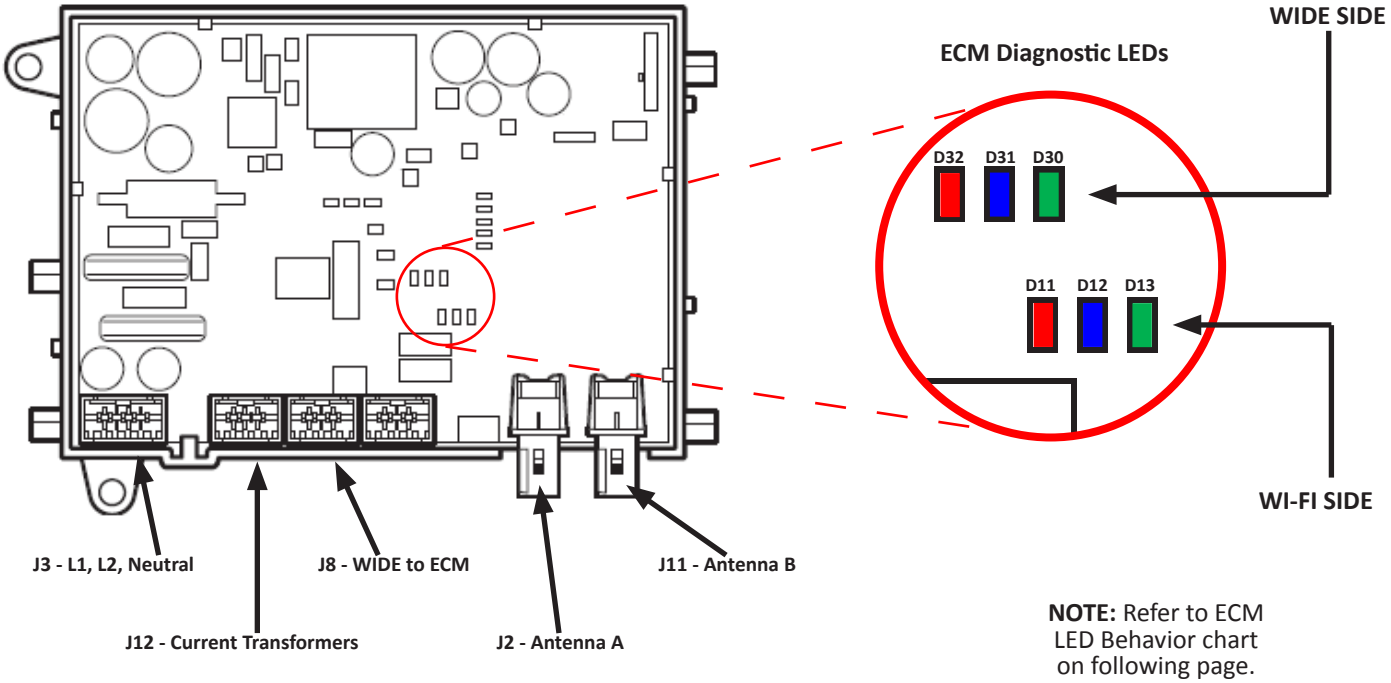

Figure 7 - ECM LEDs

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Component Testing (continued)

ECM LED Behavior

WIDE Side LED Behavior (Communication between ECM and ACU)

LED #	LED Color	Description
D32	Red LED	**Power/Heartbeat Indicator:** LED is turned ON solid when user-space software first starts running. Once all of the application code has been loaded, the LED starts flashing ON and OFF consistently, approximately once per second. **LED OFF:** Recycle power first. If not corrected, replace ECM. **LED ON or Flashing:** Normal operation, do not replace ECM, the problem is elsewhere.
D31	Blue LED	**WIDE Transmit Indicator:** LED OFF indicates the ECM is not communicating with the ACU. LED will flash ON and OFF intermittently to indicate the ECM is communicating with the ACU. **LED OFF:** Recycle power to re-initiate communication with ACU. Check connections and harness continuity between the ECM and ACU—repair if necessary. If not corrected, replace ECM. **LED Flashing Intermittently:** Normal operation, do not replace ECM, the problem is elsewhere.
D30	Green LED	**WIDE Network Indicator:** LED flashed ON and OFF fairly consistently—on average, approximately once every 2 seconds. Indicates connection status with the ACU. **LED OFF:** Recycle power to re-initiate communication with ACU. Check connections and harness continuity between the ECM and ACU–repair if necessary. If not corrected, replace ECM. **LED Flashing:** Normal operation, do not replace ECM, the problem is elsewhere.

NOTE: When recycling power, allow 1 minute for the ECM to power up and initialize before troubleshooting the LED's.

Wi-Fi® Side LED Behavior (Communication between ECM and Wireless Router)

LED #	LED Color	Description
D11	Red LED	**Wi-Fi® Transmit Indicator:** LED OFF indicates the ECM has nothing to transmit; LED will flash ON and OFF intermittently to indicate wireless network traffic between ECM and wireless router. **LED OFF:** Nothing being transmitted. **LED Flashing Intermittently:** Normal operation, do not replace ECM, the problem is elsewhere.
D12	Blue LED	**Wireless Router Indicator:** LED Off when ECM is not provisioned with router. The LED will flash rapidly during the provisioning process and then turns ON steady when provisioned/associated with the router. **LED OFF:** Indicates the Appliance/ECM is not provisioned/associated with a router—or Smart Grid button is turned off. **LED Rapid Flashing:** Indicates ECM is in the process of provisioning/associating with a router. **LED ON:** Appliance/ECM is provisioned/associated to a router. Do not replace ECM, the problem is elsewhere.
D13	Green LED	**Wi-Fi® Status Indicator:** LED flashes ON and OFF consistently, approximately once per second to indicate wireless transceiver is operational. **LED OFF:** Replace ECM—Wi-Fi® failure. **LED Flashing:** Normal operation, do not replace ECM, the problem is elsewhere.

NOTE: When recycling power, allow 1 minute for the ECM to power up and initialize before troubleshooting the LED's

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Fault Codes: ECM

ECM (External Communication Module)

⚠ WARNING

Electrical Shock Hazard

Disconnect power before servicing.

Replace all parts and panels before operating.

Failure to do so can result in death or electrical shock.

- **Fault Code 12-1 (Dish), FCE0 (Washer/Dryer), Pass/Fail (Refrigeration)**
- **ECM is not able to communicate properly with ACU (Appliance Control Unit)**

No communications between the ECM and ACU through WIDE bus. **NOTE:** WIDE is the Whirlpool protocol used in transmitting data/information between the ECM and ACU.

1. Unplug appliance or disconnect power.
2. Access External Communication Module (ECM) and remove cover.
3. Verify that all connectors are inserted all the way into the ECM.
4. Plug in appliance or reconnect power and allow a minute for the ECM to initialize.
5. Verify that LED's D30 – D32 are either ON or Flashing. (Refer to LED information on pages 4-12 & 4-13.)
   - ➢ If the LED's are on or flashing, the ECM is working properly and communicating with the ACU. Clear all error codes and repeat diagnostic test.
   - ➢ If not, unplug appliance or disconnect power and proceed to step 6.
6. Verify that all connectors are inserted all the way into the ACU—particularly the connection coming from the ECM.
7. Plug in appliance or reconnect power and allow a minute for the ECM to initialize.
8. Verify that LED's D30 – D32 are either ON or Flashing. (Refer to LED information on pages 4-12 & 4-13.)
   - ➢ If the LED's are on or flashing, the ECM is working properly and communicating with the ACU. Clear all error codes and repeat diagnostic test.
   - ➢ If not, unplug appliance or disconnect power and proceed to step 9.
9. With an ohmmeter, check the harness for continuity between the ECM and ACU.
   - ➢ If there is continuity, proceed to step 10
   - ➢ If there is no continuity, replace the harness. Proceed to step 13.
10. Replace the ECM. (Follow the instructions on page 4-18 for replacing the ECM.)
11. Plug in appliance or reconnect power and allow a minute for the ECM to initialize.
12. Verify that LED's D30 – D32 are either ON or Flashing. (Refer to LED information on pages 4-12 & 4-13.)
    - ➢ If the LED's are on or flashing, the ECM is working properly and communicating with the ACU. Proceed to step 13.
    - ➢ If not, replace the Appliance Control Unit. (Follow the instructions on page 4-18 for replacing the ACU.)
13. Unplug appliance or disconnect power.
14. Reassemble all parts and panels.
15. Clear all error codes and repeat diagnostic test.

- **Fault Code 12-2 (Dish), FCE1 (Washer/Dryer), Pass/Fail (Refrigeration)**
- **ECM is not able to communicate properly with the Wireless Router**

No link between ECM and Wireless Router.

1. Are any other wireless devices able to connect to the Home Area Network (HAN) Wireless Router?
   - ➢ No – refer customer to resolve issue with router first.
   - ➢ Yes, continue to step 2.
2. Un-provision the Smart Appliance by pressing and holding the Smart Grid Button for 20 seconds–or until a tone is heard.
3. Provision the Smart Appliance. Perform one of the procedures in Section 3 to provision the Smart Appliance to the Wireless Router.
4. Has a link been established between the ECM and Wireless Router?
   - ➢ Yes, the Smart Grid Button LED is lit and the appliance is connected to the router.
   - ➢ No, continue to step 5.
5. If using the WPS method...
   - verify the wireless router supports the WPS-2 standard (check router label or manual).
   - the router must be set to enable WPS provisioning (may need to access router software to turn enable).
   - verify the router is setup to broadcast its SSID, MAC filtering is disabled and that WPA or WPA2 wireless security is enabled.
6. Check the Wireless Router signal strength at the appliance using another wireless device.
   - ➢ If the signal is weak, a Wireless Repeater may be required to boost the signal to the appliance; or the router needs to be positioned closer to the appliance.
   - ➢ If the signal is good, proceed to step 7.
7. Unplug appliance or disconnect power.
8. Access ECM and remove cover.
9. Verify that all RAST connectors are inserted all the way into the ECM.

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10. Verity that both antenna connectors are securely connected to the ECM.
11. Plug in appliance or reconnect power.
12. Verify that LED's D11 – D13 are either ON or Flashing. (Refer to LED information on pages 4-12 & 4-13.)
    - ➢ If not, power off the appliance and replace the ECM. (Follow the instructions on page 4-18 for replacing the ECM.)
    - ➢ If the LED's are on or flashing, the ECM is working properly. Repeat steps 2 through 4 to provision appliance with Wireless Router.
13. Unplug appliance or disconnect power.
14. Reassemble all parts and panels.
15. Clear all error codes and repeat diagnostic test.

■ **Fault Code 12-3 (Dish), FCE2 (Washer/Dryer), Pass/Fail (Refrigeration)**

■ **ECM is not able to communicate properly with the Internet**

No link between ECM and Internet.

1. Press the Smart Grid Button on the appliance. If an error tone is heard, the ECM is not able to communicate with the Internet. Are any other wireless devices in the home (computers, laptops, tablets, smart phones, etc.) able to connect to the Internet through the Home Area Network (HAN)?

   NOTE: Make sure the wireless devices are connecting to the HAN and not the neighbors Wi-Fi®.
   - ➢ No—continue to step 2.
   - ➢ Yes—continue to step 6.
2. Previously, did any of the wireless devices have access to the Internet with the existing Wireless Router and Modem?
   - ➢ No—refer customer to Internet Service Provider.
   - ➢ Yes—continue to step 3.
3. Verify that the customer's Wireless Router and Modem are ON.
   - ➢ If the equipment is OFF, notify the customer to turn ON the equipment in this order: Turn on Modem and wait 2 minutes, and then turn on router and wait 2 minutes. Verify link between the ECM and the Internet.
   - ➢ If the equipment is ON, continue to step 4.
4. Verify that the Modem has access to the Internet. If the modem is successfully registered with the Internet, an "Online" or "Internet" LED will be ON.
   - ➢ If the LED is ON, continue to step 5.
   - ➢ If the LED is OFF or flashing, ask the customer to recycle power to the Modem and Wireless Router. First turn off both the Wireless Router and the Modem. After a couple of minutes, turn ON the equipment in this order: Turn on Modem and wait 2 minutes, and then turn on router and wait 2 minutes. If LED is still OFF, refer customer to resolve issue with Internet Service Provider.
5. Verify that there is communication between the Wireless Router and the Modem. The "Link" LED will be flashing on and off representing communication between the two devices.
   - ➢ If the LED is flashing, continue to step 6.
   - ➢ If the LED is OFF, refer customer to resolve issue with Wireless Router first.
6. Un-provision the Smart Appliance by pressing and holding the Smart Grid Button for 20 seconds–or until a tone is heard.
7. Provision the Smart Appliance. Perform one of the procedures in Section 3 to provision the Smart Appliance to the Wireless Router.
8. Has a link been established between the ECM and Wireless Router?
   - ➢ Yes, the Smart Grid Button LED is lit and the appliance is connected to the Wireless Router.
   - ➢ No, continue to step 9.
9. If using the WPS method...
   - verify the wireless router supports the WPS-2 standard (check router label or manual).
   - the router must be set to enable WPS provisioning (may need to access router software to turn enable).
   - verify the router is setup to broadcast its SSID, MAC filtering is disabled and that WPA or WPA2 wireless security is enabled.
10. Check the Wireless Router signal strength at the appliance using another wireless device.
    - ➢ If the signal is weak, a Wireless Repeater may be required to boost the signal to the appliance, or the router needs to be positioned closer to the appliance.
    - ➢ If the signal is good, proceed to step 11.
11. Unplug appliance or disconnect power.
12. Access ECM and remove cover.
13. Verify that all RAST connectors are inserted all the way into the ECM.
14. Verity that both antenna connectors are securely connected to the ECM.
15. Plug in appliance or reconnect power.
16. Verify that LED's D11 – D13 are either ON or Flashing. (Refer to LED information on pages 4-12 & 4-13.)
    - ➢ If not, power off the appliance and replace the ECM. (Follow the instructions on page 4-18 for replacing the ECM.)
    - ➢ If the LED's are on or flashing, the ECM is working properly. Repeat steps 2 through 4 to provision appliance with Wireless Router.
17. Unplug appliance or disconnect power.
18. Reassemble all parts and panels.
19. Clear all error codes and repeat diagnostic test.

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Fault Codes: Antennas A & B

⚠ WARNING

Electrical Shock Hazard

Disconnect power before servicing.

Replace all parts and panels before operating.

Failure to do so can result in death or electrical shock.

Antenna A not functioning

■ **Fault Code 12-4 (Dish), FCE3 (Washer/Dryer), Pass/Fail (Refrigeration)**

The antenna sensing circuit indicates that Antenna A is not operational.

1. Unplug appliance or disconnect power.
2. Access External Communication Module (ECM) and remove cover.
3. Verify that all RAST connectors are inserted all the way into the ECM.
4. Verity that both antenna connectors are securely connected to the ECM. Check for sharp bends in the antenna cables, particularly by the connector on the ECM (see figures 8–11 below).
5. Plug in appliance or reconnect power and allow a minute for the ECM to initialize.
6. Clear all error codes and repeat diagnostic test. Is fault code cleared?
   - ➢ Yes, continue to step 12.
   - ➢ No, continue to step 7.
7. Unplug appliance or disconnect power.
8. Switch Antenna A with Antenna B at the ECM.
9. Plug in appliance or reconnect power and allow a minute for the ECM to initialize.
10. Clear all error codes and repeat diagnostic test. Has the fault code moved over to Antenna B?
    - ➢ Yes, replace bad antenna.
    - ➢ No, continue to step 11.
11. Replace the ECM. (Follow the instructions on page 4-18 for replacing the ECM.)
12. Unplug appliance or disconnect power.
13. Reassemble all parts and panels.
14. Clear all error codes and repeat diagnostic test.

Antenna B not functioning

■ **Fault Code 12-5 (Dish), FCE4 (Washer/Dryer), Pass/Fail (Refrigeration)**

The antenna sensing circuit indicates that Antenna B is not operational.

1. Unplug appliance or disconnect power.
2. Access External Communication Module (ECM) and remove cover.
3. Verify that all RAST connectors are inserted all the way into the ECM.
4. Verity that both antenna connectors are securely connected to the ECM. Check for sharp bends in the antenna cables, particularly by the connector on the ECM (see figures 8–11 below).
5. Plug in appliance or reconnect power and allow a minute for the ECM to initialize.
6. Clear all error codes and repeat diagnostic test. Is fault code cleared?
   - ➢ Yes, continue to step 12.
   - ➢ No, continue to step 7.
7. Unplug appliance or disconnect power.
8. Switch Antenna B with Antenna A at the ECM.
9. Plug in appliance or reconnect power and allow a minute for the ECM to initialize.
10. Clear all error codes and repeat diagnostic test. Has the fault code moved over to Antenna A?
    - ➢ Yes, replace bad antenna.
    - ➢ No, continue to step 11.
11. Replace the ECM. (Follow the instructions on page 4-18 for replacing the ECM.)
12. Unplug appliance or disconnect power.
13. Reassemble all parts and panels.
14. Clear all error codes and repeat diagnostic test.

Do not allow sharp bends in the antenna cable.

INCORRECT

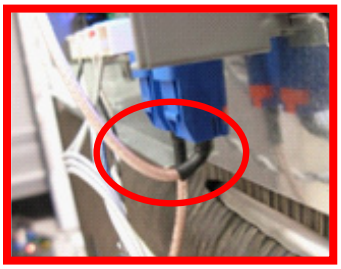


Figure 8

INCORRECT

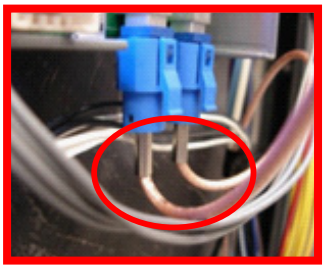


Figure 9

INCORRECT

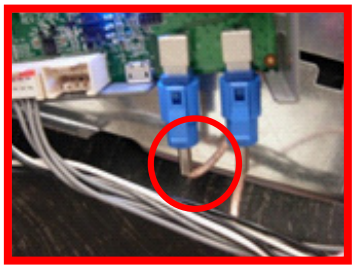


Figure 10

CORRECT !!!

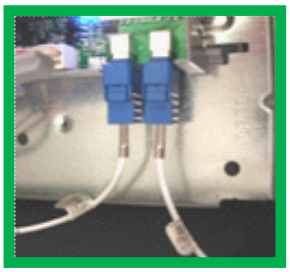


Figure 11

For Service Technician Use Only

Fault Codes: Current Transformers

⚠ WARNING

Electrical Shock Hazard

Disconnect power before servicing.

Replace all parts and panels before operating.

Failure to do so can result in death or electrical shock.

Current transformer A not functioning

■ **Fault Code 12-6 (Dish), FCE5 (Washer/Dryer), Pass/Fail (Refrigeration)**

The current transformer is not operational.

1. Unplug appliance or disconnect power.
2. Access External Communication Module (ECM) and remove cover.
3. Verify that all RAST connectors are inserted all the way into the ECM.
4. Plug in appliance or reconnect power and allow a minute for the ECM to initialize.
5. Clear all error codes and repeat diagnostic test. Is fault code cleared?
   - ➢ Yes, continue to step 9.
   - ➢ No, continue to step 6.
6. Unplug appliance or disconnect power.
7. Remove connector J12 from the ECM. With an ohmmeter, verify resistance of the current transformer across the J12 pins 1 & 2. Resistance should be 135 Ω ±5%.
   - ➢ If values are correct, proceed to step 8.
   - ➢ If values are open or out of range, replace Current Transformer A or internal harness depending on appliance.
8. Replace the ECM. (Follow the instructions on page 4-18 for replacing the ECM.)
9. Unplug appliance or disconnect power.
10. Reassemble all parts and panels.
11. Clear all error codes and repeat diagnostic test.

Current transformer B not functioning

■ **Fault Code FCE6 (Dryer) (available on 240V AC appliances only)**

The current transformer is not operational.

1. Unplug appliance or disconnect power.
2. Access External Communication Module (ECM) and remove cover.
3. Verify that all RAST connectors are inserted all the way into the ECM.
4. Plug in appliance or reconnect power and allow a minute for the ECM to initialize.
5. Clear all error codes and repeat diagnostic test. Is fault code cleared?
   - ➢ Yes, continue to step 9.
   - ➢ No, continue to step 6.
6. Unplug appliance or disconnect power.
7. Remove connector J12 from the ECM. With an ohmmeter, verify resistance of the current transformer across the J12 pins 1 & 2. Resistance should be 135 Ω ±5%.
   - ➢ If values are correct, proceed to step 8.
   - ➢ If values are open or out of range, replace Current Transformer B or internal harness depending on appliance.
8. Replace the ECM. (Follow the instructions on page 4-18 for replacing the ECM.)
9. Unplug appliance or disconnect power.
10. Reassemble all parts and panels.
11. Clear all error codes and repeat diagnostic test.

Fault Codes: Provisioning Error/Timeout

■ **Not able to provision appliance with Wireless Router**

■ **Fault Code 12-7 (Dish), FCE7 (Washer/Dryer), Pass/Fail (Refrigeration)**

Unable to provision appliance to Wireless Router

1. WPS Button on the Wireless Router was not pressed within 2 minutes of starting the linking mode on the appliance. This may require two people to complete within the 2 minute time frame.

   or

   Smart Grid Button on the appliance was not pressed within 2 minutes of starting the linking mode on the Wireless Router. This may require two people to complete within the 2 minute time frame.
2. You must complete the provisioning process for one appliance before beginning to provision the next.
3. If using the WPS method...
   - verify the wireless router supports the WPS-2 standard (check router label or manual).
   - the router must be set to enable WPS provisioning (may need to access router software to turn enable).
   - verify the router is setup to broadcast its SSID, MAC filtering is disabled and that WPA or WPA2 wireless security is enabled.
4. The Wireless Router is too far away from the appliance, or there is too much interference (microwave oven, fluorescent lights, etc.) between the router and appliance. If possible, place the wireless router closer.
5. For additional checks, refer to the Troubleshooting Guide on pages 4-8 to 4-9, “Unable to Provision Appliance to Router.”

For Service Technician Use Only

Replacement Procedures

External Communication Module (ECM) is Replaced

The replacement ECM will have a new Smart Appliance ID (SAID). A new label will be included for the technician to place on the appliance over the original label.

Re-provision Process

1. Power up the appliance.
2. Provision ECM to Wireless Router using one of the provisioning methods in Section 3.
3. From a computer, laptop, tablet, or smart phone; access the user's account and enter the Smart Appliance ID (SAID) of the new ECM.
4. A new appliance will appear in the user's account that will look just like the original appliance; same model number and serial number.
   - User will have to create notification settings for the new appliance.
   - User will have to create energy profile for the new appliance (when profile is at appliance level).
   - Time series data, such as energy consumption per cycle, will be lost.
   - Data that persists in the appliance, such as odometer, will be updated in the new appliance data model as it changes.
   - The 'in-service' date will be captured when the new ECM is claimed.
5. The original appliance will appear 'off-line'; the user can delete this appliance if they no longer want to view its historical information.

Appliance Control Unit (ACU) is Replaced

The replacement ACU will not have Brand, Model Number, or Serial Number, but will have category type.

Re-provision Process

1. Power up the appliance.
2. ECM will re-provision to Wireless Router and re-register with WISE (Whirlpool Integrated Service Environment).
3. WISE will detect that the Brand, Model number and Serial number are blank and will not over-write the existing Model number and Serial number, it will assume it is the same appliance.
4. When the user logs into their account, the original appliance will appear.
5. Since the ACU is new, the information in the data model will not be in synch with the appliance.
   - As the appliance is used, the data model will be updated and synchronized with the appliance.
   - Some data will be lost, such as odometer, since the new appliance control does not have historical information.
   - The 'in-service' date is not changed.

External Communications Module (ECM) and Appliance Control Unit (ACU) is Replaced

The replacement ECM will have a new Smart Appliance ID (SAID). A new label will be included for the technician to place on the appliance over the previous label.

The replacement ACU will not have Brand, Model Number, or Serial Number, but will have category type.

Re-provision Process

1. Power up the appliance.
2. Provision ECM to Wireless Router using one of the provisioning methods in Section 3.
3. From a computer, laptop, tablet, or smart phone; access the user's account and enter the Smart Appliance ID (SAID) of the new ECM.
4. A new appliance will appear in the user's account that will look just like the original appliance. Model Number and Serial Number will be blank.
   - User will have to create notification setting for the new appliance.
   - User will have to create energy profile for the new appliance (when profile is at appliance level).
   - All appliance data will be lost.
   - The 'in-service' date will be captured when the new ECM is claimed.
5. The original appliance will appear 'off-line'; the user can delete this appliance if they no longer want to view its historical information.

Wireless Router is Replaced

New Wireless Router should have WPS-2 technology. You may need to access the router software to turn on this feature.

Re-provision Process

1. Power up the Smart Appliance(s) and de-provision each one.
2. Re-provision each appliance to new Wireless Router using one of the provisioning methods in Section 3.
3. ECM re-registers with WISE (Whirlpool Integrated Service Environment).
4. Appliance will appear in user's account as normal.

For Service Technician Use Only

Troubleshooting Network Connectivity

IMPORTANT: The following information is provided solely for the purpose of understanding the basic concepts and issues relating to network connectivity. However, if the customer's Wireless Router or Modem is the cause for the Smart Appliance(s) not being able to connect to the Internet, the customer must affect repairs themselves or with the modem and/or router's tech support.

IMPORTANT: Do NOT attempt to reconfigure or repair any non-Whirlpool networking products; including, but not limited to; computers, modems, routers, and extenders.

NOTES: To use Smart Appliance features on a Smart Appliance, the consumer must have a working Internet connection. If not, the appliance will still function normally without Internet access, but will be unable to utilize any Smart features.

Smart Appliance or ALL In-Home Wi-Fi® Devices?

1. Ask the customer if ANY wireless devices in the home are able to connect to the Internet? For example, in-home computers, laptops, tablets, cell phones, TV's, game systems, etc.
2. If none of the in-home Wi-Fi® or "connected" devices can access the Internet, the problem is not with the Smart Appliance, but with the customer's ISP, modem, router, security, network configuration, or cabling.
3. If other Wi-Fi® devices can access the Internet, verify that it's through the in-home router and not the neighbors.

Recycle Power

In short, recycling power to the modem, router, extender (if exists), and computer will solve Internet connection issues 90% of the time—especially if they previously worked.

To properly recycle power, 1) Power down the computer (completely off—not standby or hibernate); 2) Turn off the router and if exists, the extender; and 3) Turn off the modem. NOTE: It is best to disconnect the power cable from the modem and router to ensure the power has been removed.

IMPORTANT: Always restart the network in this order: 1) Turn on modem; wait 2 minutes, 2) Turn on router; wait 2 minutes, 3) If using a Wi-Fi® extender, turn on and wait 2 minutes, 4) Turn on computer.

No Power or Lights on Modem or Router

1. Check that modem and/or router is securely plugged into outlet. Is outlet controlled by light switch?
2. Check if modem and/or router is plugged into power strip. Verify power strip is plugged in and switched ON.
3. Try different electrical outlet.
4. If the user is still not getting any lights, have the customer contact the modem or router manufacturer's help desk.

Cables and Connections

1. Verify all cable connections between the ISP (phone, cable, satellite companies) and modem, the modem and router, and the router and computer. Check that phone cables (RJ-11), Ethernet cables (RJ-45) are completely inserted into their respective connectors; and if used, coaxial cables are securely attached onto their ports.
2. Refer to the manufacturer's user guide for attaching the proper cables to their proper ports.
3. Make sure the correct Ethernet cables are being used. When connecting between modem, router, and computer, use patch (straight-through) cables, not crossover cables.
4. If the cable looks worn or damaged, try another cable.

Modem Check

1. Turn off computer, router, and modem. Disconnect the wireless router, and connect the computer or laptop directly to the modem. Turn on the modem and wait for 2 minutes. (The WAN/Internet LED on the modem should be on to indicate the modem has established a connection to the Internet.) Now, turn on the computer and check for Internet access.
2. If the user is not able to access the Internet with just the broadband modem connected, have the consumer contact their Internet Service Provider (ISP) for assistance.
3. If the user is able to get online, the problem is with the router.

Router Check

1. Wired Connections – verify that the computer connects directly with the router. The computer's Ethernet port should connect to one of the numbered ports on the router (1, 2, 3, or 4). When connecting between modem, router, and computer, use patch (straight-through) cables, not crossover cables.
2. Wireless Connections – if using a wireless USB adapter, be certain it is not loose. If using a built-in wireless adapter, make sure that wireless adapter is enabled and for either device—the proper drivers are loaded.
3. Make sure the computer is not out-of-range of the wireless router. An extender may be necessary to increase range.
4. Verity that the router is configured for DHCP, used for automatically assigning IP addresses.
5. If the user is not able to access the Internet at all, have the consumer contact the router manufacturer for assistance.

Continued . . .

Additional Checks

Turn off the Firewall software.

If after disabling the Firewall software the customer is able to access the Internet, check the documentation that came with the software to properly configure the Firewall.

Verify correct IP & Network Information

Verify correct IP Information including IP Address, Subnet Mask, Default Gateway, DHCP, and DNS Servers. To verify, at the command prompt, run "IPCONFIG /ALL" to view router information. (Procedure is dependent on OS version.)

Ping Test (IP Address & Name)

This can be done by the same command prompt used to run IPCONFIG.

Try pinging the router's IP address (e.g. ping 192.168.1.1). If you get a reply, the connection between the computer and router is good. If not, do other computers have the same problem? Check the network cable, network card, and port on router.

Try pinging an external site by IP address (e.g. ping 74.125.225.66)(google.com). If you get a reply, you have a connection to the Internet. If not, access the router using the web browser and check status of the router.

Try pinging an external site by Name (e.g. ping www.google.com). If you get a reply, you have a connection to the Internet and DNS is working. If not, access the router using the web browser and check its status and DNS entries.

Internet Browser Settings

If you were successful pinging external sites by both IP address and name, but are still unable to access the Internet, the web browser may be misconfigured. Check that you don't have an incorrect or not needed Proxy server assigned. For the Internet Explorer, select Tools > Internet Options. Click on the Connections tab and makes sure the "Never dial a connection" setting is selected. Click on the LAN settings button and uncheck "Automatically detect settings" and "Use a proxy server for your LAN" (if no Proxy is needed). Reboot and check Internet connection.

Notes

Section 5: Dishwasher

This section provides product specific information, error codes, component locations, and wiring diagram for the “Dishwasher Smart Appliance.”

- Model Number
- Location of SAID & Serial Number Tag
- Smart Appliance Component Locations
- Smart User Interface
- ECM (External Communications Module)
- Front & Rear Antennas
- Current Transformer
- Dishwasher Error Codes
- Dishwasher Wiring Diagram
- Dishwasher Smart Features
- Notes

For Service Technician Use Only

Model Number

Original Model Number	WDF750SAY*
Smart Appliance Model Number	WDL785SAAM*

** Represents color & engineering revision*

The only difference between the original model and the Smart Appliance model are the Smart Appliance components; Smart User Interface, ECM, Antennas, and Current Transformer.

If the dishwasher is hooked up without Internet service, it will function similar to a non-Smart Appliance dishwasher.

Location of SAID and Serial Number Label for ECM

Figure 1 - Location of SAID & Serial Number Label

Dishwasher Smart Appliance Components & Locations

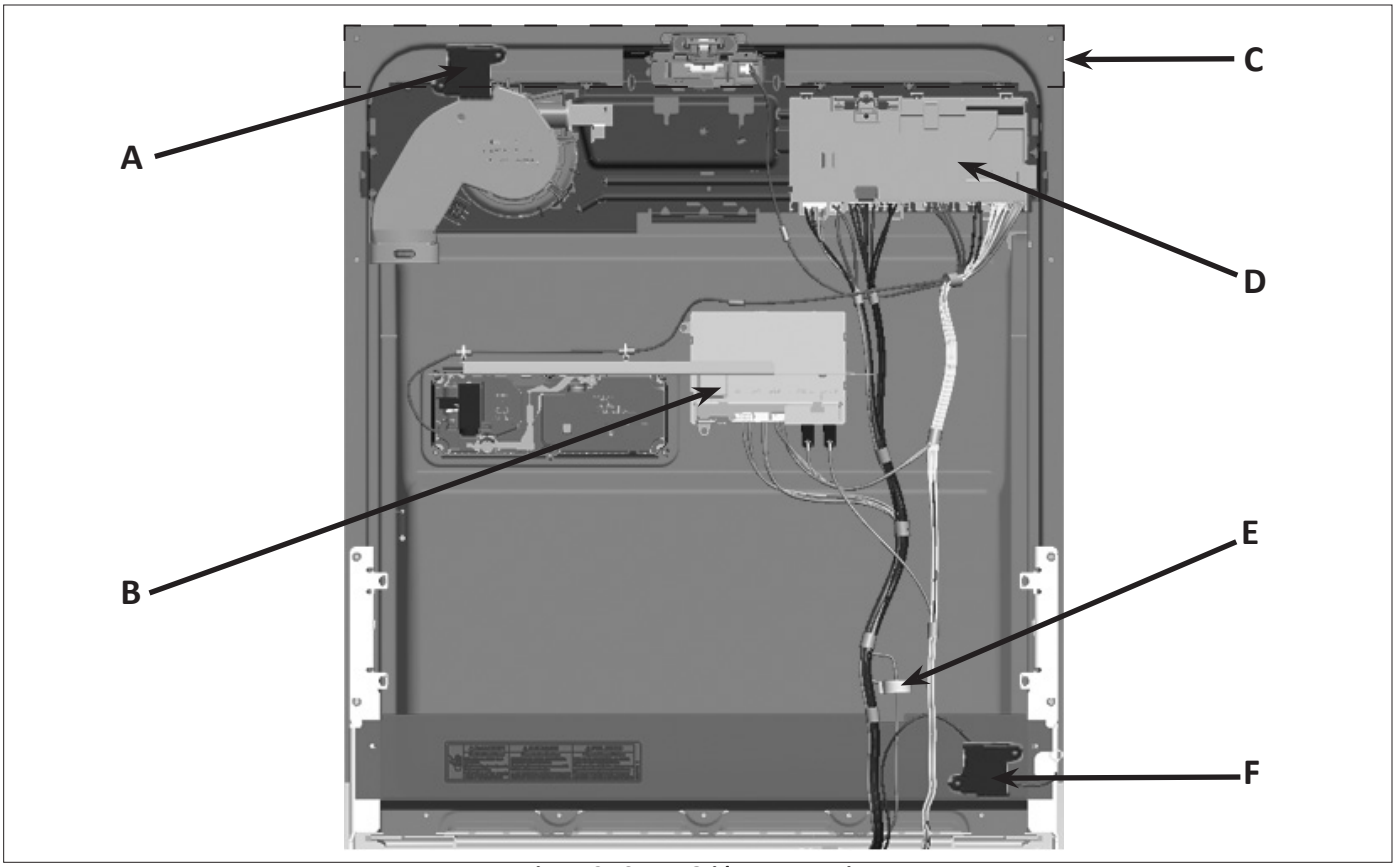


Figure 2 - Smart Grid Parts Location

A. Front Antenna (in console)
B. External Communication Module
C. Smart User Interface
D. Appliance Control Unit (ACU)
E. Current Transformer
F. Rear Antenna (on back of tub)

For Service Technician Use Only

Smart User Interface

The WDL785SAAM dishwasher control panel features a 2.5-inch console with tactile buttons and LED indicator lights in blue, green, and amber. Below, figure 3 shows a rendering for a dishwasher Smart User Interface.

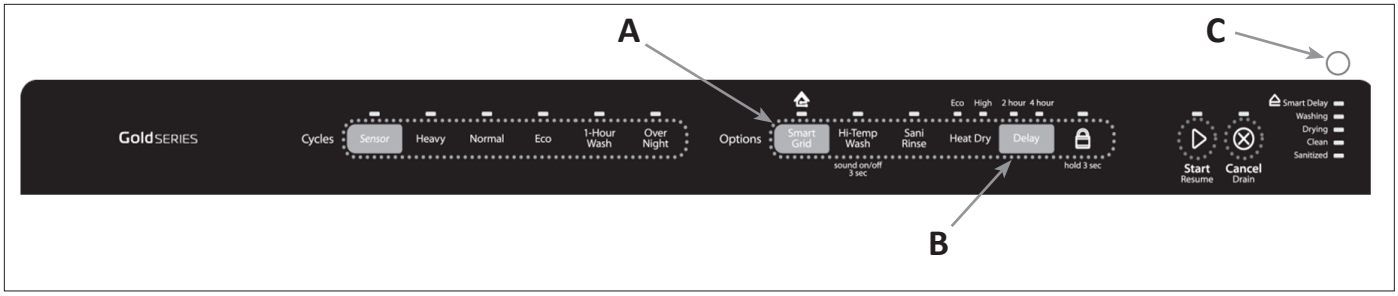


Figure 3 - Dishwasher Smart User Interface

A. Smart Grid button provides Override feature
Blue = On – Smart Grid Enabled
Blue = Off – Smart Grid Disabled
Blinking Blue = Provisioning
B. Delay key adds Smart Delay as an option in addition to 4 hour delay
C. A bi-color (green and amber) Energy status LED is added to represent the Grid Status
Green = Off-peak pricing
Amber = Peak pricing
Blinking Amber = Grid Event

ECM (External Communications Module)

The ECM provides the interface between the Smart Appliance and the Wi-Fi® network (Internet). The ECM is located inside the door assembly, to the right of the dispenser and below the ACU.

- Wi-Fi® radio module
- Power Measurement circuit
- Switch Mode Power Supply
- Common cross-category design

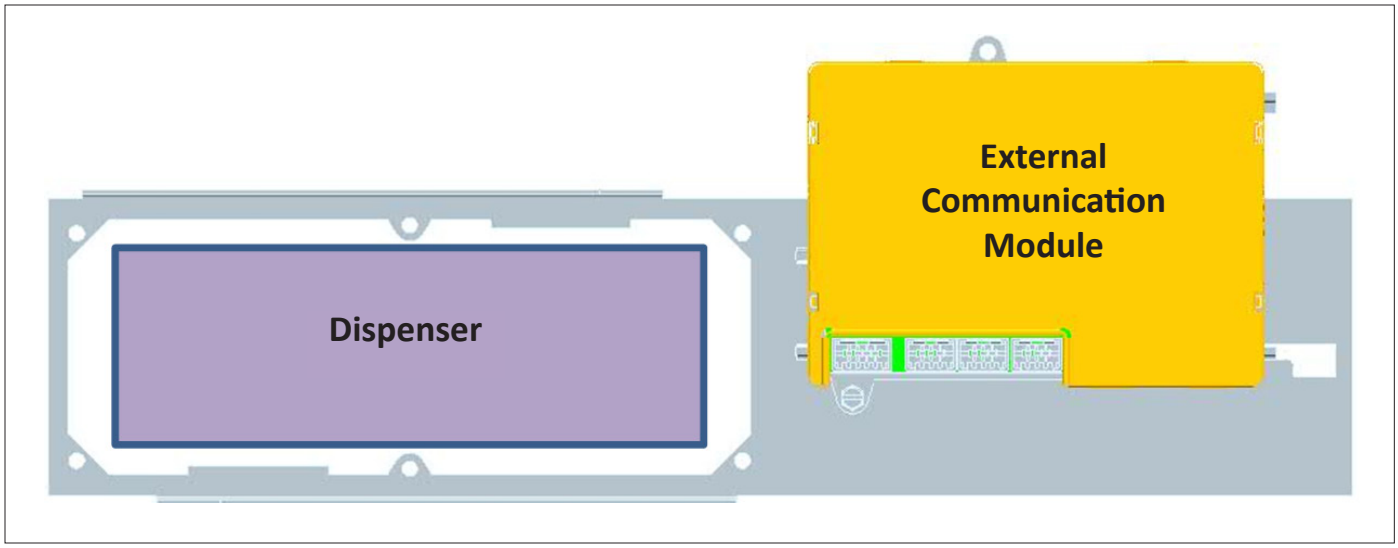


Figure 4 - Dishwasher ECM Location

For Service Technician Use Only

Front & Rear Antennas

- Two antennas are necessary to provide robust Wi-Fi® coverage
- Same antenna design is used on the console and rear of the dishwasher (see figures 5 & 6)
- Common cross-category design

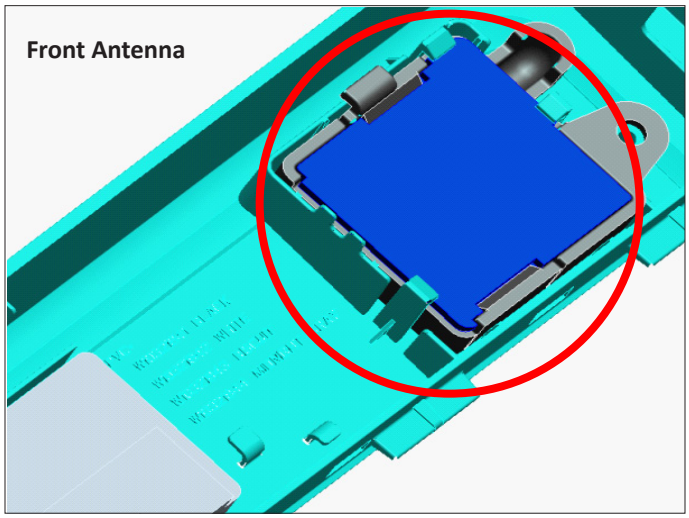


Figure 5 - Front Antenna Location

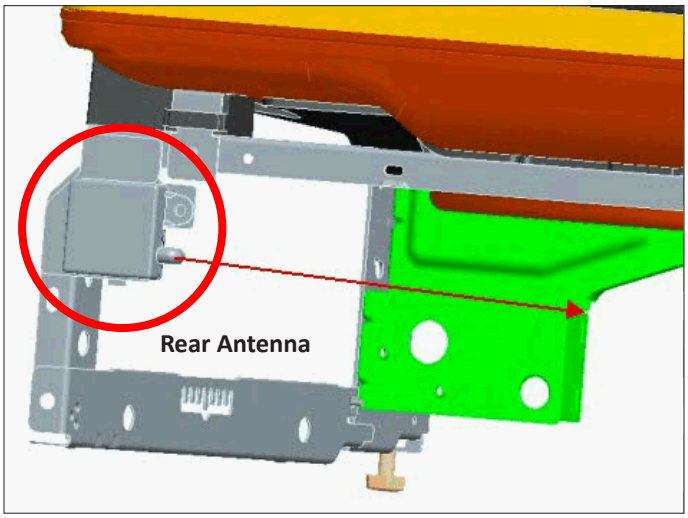


Figure 6 - Rear Antenna Location

Current Transformer

- Acts like an amp probe on L1 to measure entire machine current so that actual power can be calculated
- Current transformer is integrated into the appliance wiring harness of the dishwasher (see figure 7)
- Common cross-category design

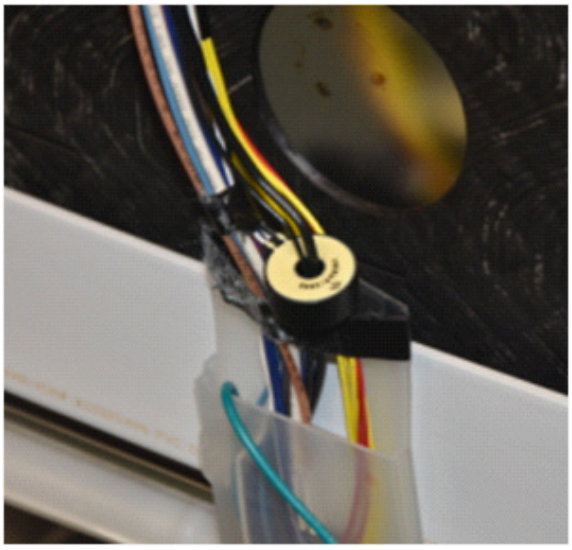


Figure 7 - Current Transformer Location

⚠ WARNING

Electrical Shock Hazard

Disconnect power before servicing.

Replace all parts and panels before operating.

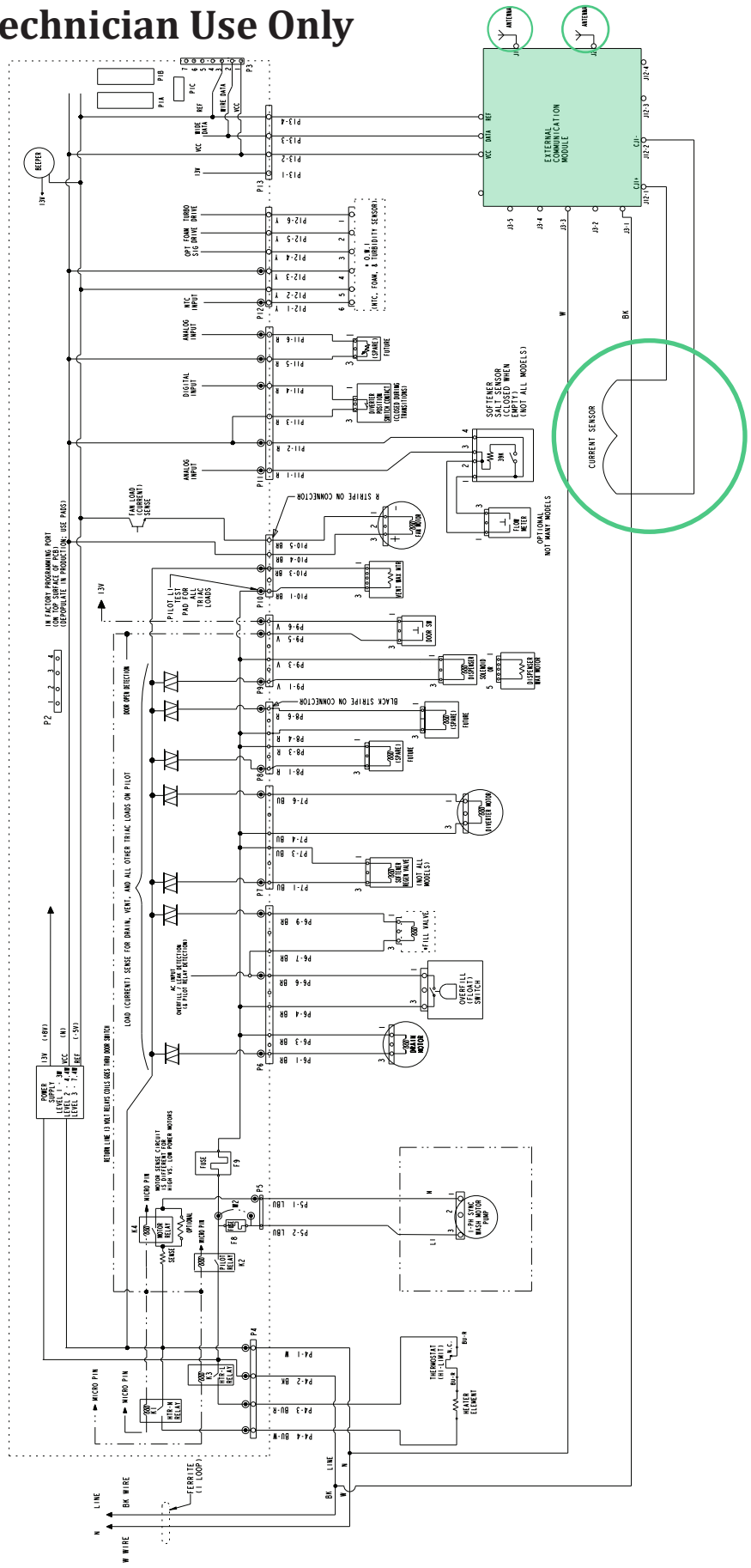
Failure to do so can result in death or electrical shock.

Dishwasher Smart Appliance Error Codes

DISHWASHER SMART APPLIANCE			ERROR CODES	
			Dishwasher	
Problem Failure	Cause	Check	Function	Problem
No communication between ECM and Control	▪ Loose connection in ECM or Control ▪ Communication bus or loose connection on ECM L1/N	1. Unplug appliance or disconnect power and check all connections to ECM. 2. Remove cover on ECM, restore power and visually inspect and verify that the LEDs D30 – D32 are on or flashing. If not, power off the unit and replace the ECM. If the LEDs are on and flashing, then power off the unit, reinstall the ECM cover and continue checking other components (the ECM is working properly. Problem is elsewhere).	12	1
No link between ECM and Wireless Router	▪ Appliance not linked to wireless router	Press and hold Smart Grid button for 20 seconds, press WPS button on wireless router and press and release the Smart Grid button within 2 minutes.	12	2
No link between ECM and Internet	▪ The appliance is not receiving signal from the wireless router.	Press the Smart Grid button; if an error tone sounds, check to be sure the router is on and connected to the Internet.	12	3
Antenna A problem	▪ Loose connection in Antenna A circuit	Unplug appliance or disconnect power and check all connections in Antenna A circuit. Fix/replace Antenna A.	12	4
Antenna B problem	▪ Loose connection in Antenna B circuit	Unplug appliance or disconnect power and check all connections in Antenna B circuit. Fix/replace Antenna B.	12	5
Current Transformer A problem	▪ Loose connection in Current Transformer A circuit	Unplug appliance or disconnect power and check all connections in Current Transformer A circuit. Fix/replace Current Transformer.	12	6
Current Transformer B problem	▪ Loose connection in Current Transformer B circuit	Unplug appliance or disconnect power and check all connections in Current Transformer B circuit. Fix/replace Current Transformer.	NA	NA
Provisioning problem	▪ A timeout occurs, multiple responses from wireless router, or message failures during linking process.	Check the following: 1. WPS Button on the wireless router was not pressed within 2 minutes of starting the linking mode on the appliance. This may require two people to complete within the 2-minute time frame. 2. The wireless router must be set to enable WPS provisioning. Verify the router is setup to broadcast its SSID, MAC filtering is disabled and that either WPA or WPA2 wireless security is enabled. 3. You must complete the linking process for one appliance before beginning to link the next. 4. The wireless router is too far away from the appliance, or there is too much interference (microwave oven, fluorescent lights, etc.) between the router and appliance. If possible, place the wireless router closer.	12	7

For Service Technician Use Only

Smart Appliance Components are circled or shaded.



Dishwasher Wiring Diagram

Figure 8 - Dishwasher Wiring Diagram

For Service Technician Use Only

Smart Features

This Whirlpool dishwasher has built-in wireless connectivity, which enables many other features to be accessed by a remote device such as a smart phone, computer, tablet, etc. Below is a summary of these additional features that are available for the dishwasher at www.whirlpool.com/smart.

Smart Notifications

- **Dishes Clean**

  Notifies the consumer remotely that their dishes are clean
- **Affresh® Nudge**

  This feature enables the consumer to receive remotely a notification that the dishwasher recommends an Affresh® cycle to be run. Affresh® removes unsightly hard water and filming from the dishwasher and internal operating parts that may affect dishwasher performance.

Smart Assistant

- **Control Lock**

  This feature enables the consumer to remotely change the state of the dishwasher user interface's Control Lock feature.

Smart Stats

- **Start Date**

  Displays the appliance start date.
- **Cycle Counter, Cycle Progress**

  Allows the consumer to remotely check on the progress of a wash cycle, providing up-to-the-minute information on what cycle is running and the estimated time remaining in the cycle.

Smart Energy

- **Energy Advisor**
- **Rate Revealer**
- **Smart Delay**

  Allows the consumer to monitor, manage, and control their energy consumption.

Buy Supplies

- **Affresh® Dishwasher Cleaner**
- **Affresh® Stainless Steel Cleaner**
- **Extended Warranty**

Notes

Section 6: Refrigerator

This section provides product specific information, error codes, component locations, and wiring diagram for the “Refrigerator Smart Appliance.”

- Model Number
- Location of SAID & Serial Number Tag
- Refrigeration Smart Appliance Components
- Smart User Interface (Stealth)
- ECM (External Communications Module)
- Front & Rear Antennas
- Current Transformer
- Refrigerator Error Codes
- Refrigerator Wiring Diagram
- Refrigerator Smart Features
- Notes

For Service Technician Use Only

Model Number

Original Model Number	GSS26C4*
Smart Appliance Model Number	WRL767SIAN*

** Represents color & engineering revision*

The only difference between the original model and the Smart Appliance model are the Smart Appliance components; Smart User Interface, ECM, Antennas, and Current Transformer.

If the refrigerator is hooked up without Internet service, it will function similar to a non-Smart Appliance refrigerator.

Location of SAID and Serial Number Label for ECM

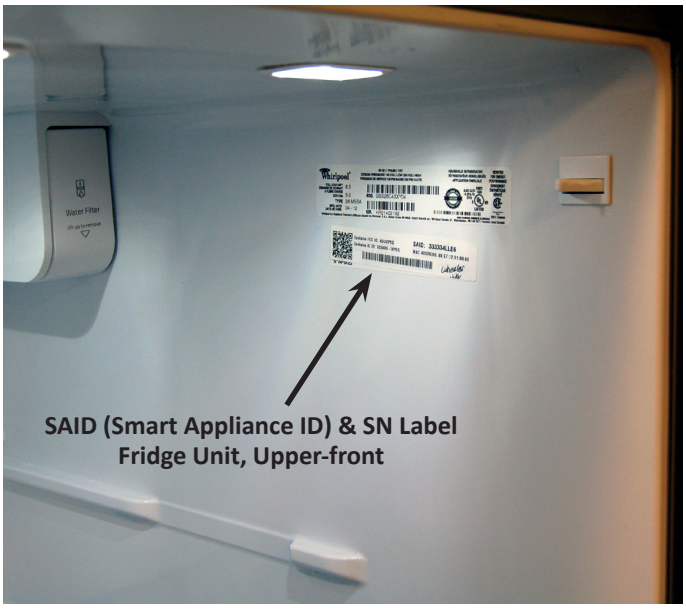


Figure 1 - Location of SAID & Serial Number Label

Refrigerator Smart Appliance Components & Locations

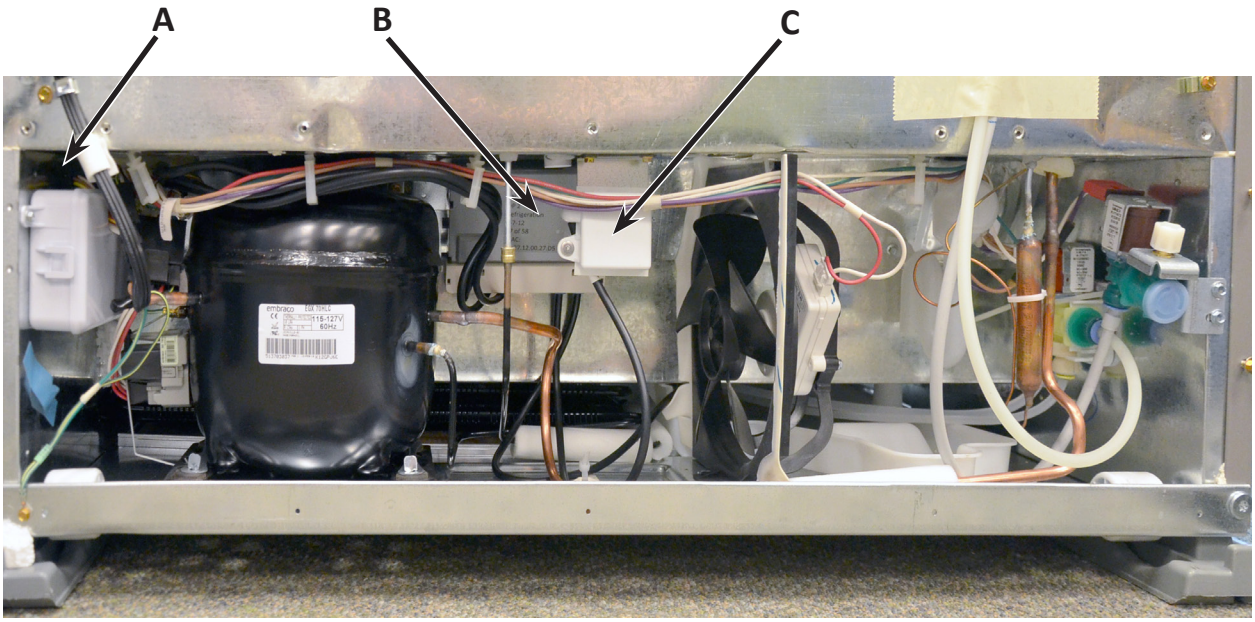


Figure 2 - Refrigerator Smart Appliance Parts Location

A. Current Transformer (behind LED light driver)
B. External Communication Module (behind rear antenna)
C. Rear Antenna (front antenna is behind front grille)

For Service Technician Use Only

Smart User Interface (Stealth)

The SMART GRID button has 4 functions: 1) provision the refrigerator to the wireless router, 2) reset the ECM to factory defaults, 3) override performance response to Smart Grid signals, and 4) turn off cooling with a long press together with FILTER RESET. See Figure 3.

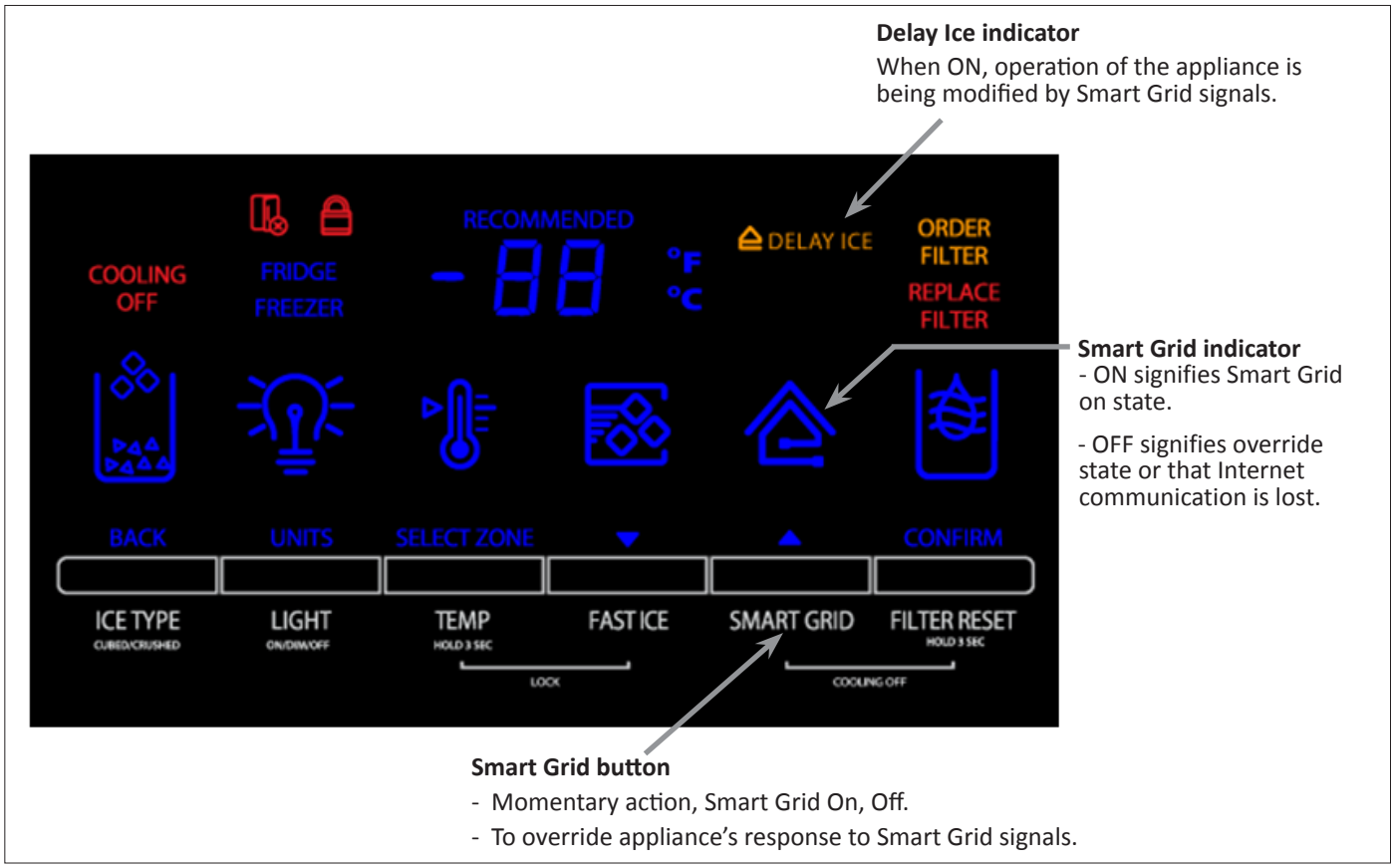
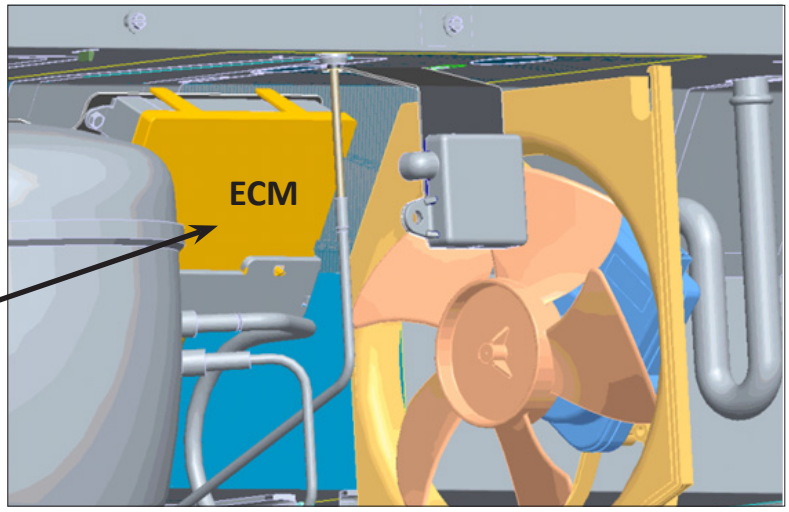


Figure 3 - Refrigerator Smart Grid User Interface

ECM (External Communications Module)

The ECM provides the interface between the Smart Appliance and the Wi-Fi® network (Internet). The ECM is located in the compressor compartment, to the right of the compressor behind the rear antenna (see figure 4).

- Wi-Fi® radio module
- Power Measurement circuit
- Switch Mode Power Supply
- Common cross-category design



ECM - Mounted in compressor compartment behind rear antenna.

Figure 4 - Refrigerator ECM Location

For Service Technician Use Only

Front & Rear Antennas

- Two antennas are necessary to provide robust Wi-Fi® coverage
- Same antenna design is used behind the front grille and in rear compressor compartment in refrigerator (see figures 5 & 6)
- Common cross-category design

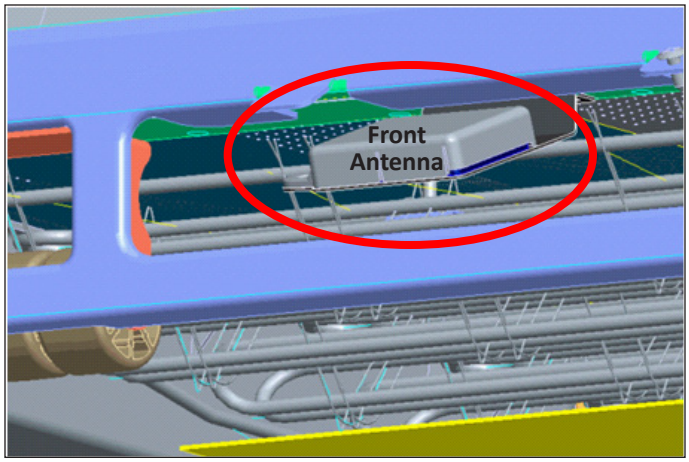


Figure 5 - Front Antenna (located behind front grille)

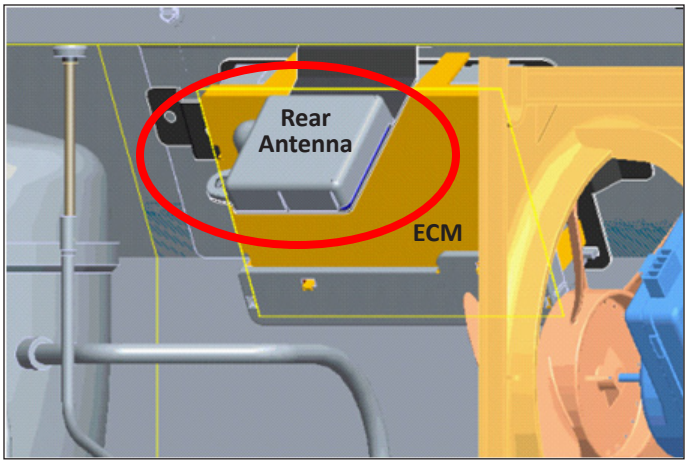


Figure 6 - Rear Antenna (located in compressor compartment in front of External Communication Module)

Current Transformer

- Acts like an amp probe on L1 to measure entire machine current so that actual power can be calculated
- Current transformer is integrated into the appliance wiring harness of the refrigerator
- Current transformer is located behind the LED Light Driver in compressor compartment
- Common cross-category design

Figure 7 - Current Transformer (located behind LED light driver)

⚠ WARNING

Electrical Shock Hazard

Disconnect power before servicing.

Replace all parts and panels before operating.

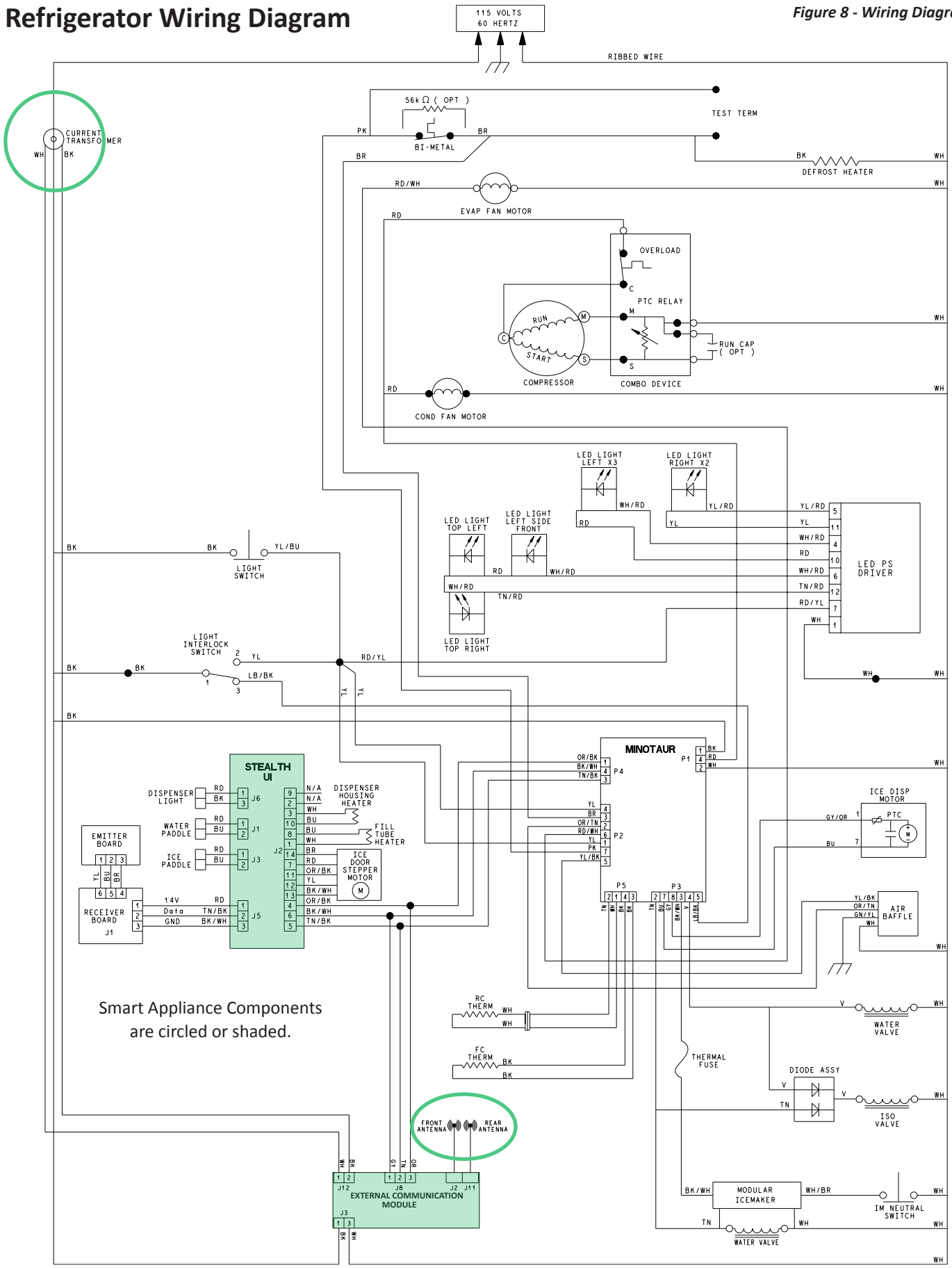
Failure to do so can result in death or electrical shock.

Refrigerator Smart Appliance Error Codes

REFRIGERATOR SMART APPLIANCE			ERROR CODES	
			Refrigeration	
Problem Failure	Cause	Check	Function	Problem
No communication between ECM and Control	▪ Loose connection in ECM or Control ▪ Communication bus or loose connection on ECM L1/N	1. Unplug appliance or disconnect power and check all connections to ECM. 2. Remove cover on ECM, restore power and visually inspect and verify that the LEDs D30 – D32 are on or flashing. If not, power off the unit and replace the ECM. If the LEDs are on and flashing, then power off the unit, reinstall the ECM cover and continue checking other components (the ECM is working properly. Problem is elsewhere).	Pass/Fail	
No link between ECM and Wireless Router	▪ Appliance not linked to wireless router	Press and hold Smart Grid button for 20 seconds, press WPS button on wireless router and press and release the Smart Grid button within 2 minutes.	Pass/Fail	
No link between ECM and Internet	▪ The appliance is not receiving signal from the wireless router.	Press the Smart Grid button; if an error tone sounds, check to be sure the router is on and connected to the Internet.	Pass/Fail	
Antenna A problem	▪ Loose connection in Antenna A circuit	Unplug appliance or disconnect power and check all connections in Antenna A circuit. Fix/replace Antenna A.	Pass/Fail	
Antenna B problem	▪ Loose connection in Antenna B circuit	Unplug appliance or disconnect power and check all connections in Antenna B circuit. Fix/replace Antenna B.	Pass/Fail	
Current Transformer A problem	▪ Loose connection in Current Transformer A circuit	Unplug appliance or disconnect power and check all connections in Current Transformer A circuit. Fix/replace Current Transformer.	Pass/Fail	
Provisioning problem	▪ A timeout occurs, multiple responses from wireless router, or message failures during linking process.	Check the following: 1. WPS Button on the wireless router was not pressed within 2 minutes of starting the linking mode on the appliance. This may require two people to complete within the 2-minute time frame. 2. The wireless router must be set to enable WPS provisioning. Verify the router is setup to broadcast its SSID, MAC filtering is disabled and that either WPA or WPA2 wireless security is enabled. 3. You must complete the linking process for one appliance before beginning to link the next. 4. The wireless router is too far away from the appliance, or there is too much interference (microwave oven, fluorescent lights, etc.) between the router and appliance. If possible, place the wireless router closer.	Pass/Fail	

Refrigerator Wiring Diagram

Figure 8 - Wiring Diagram



For Service Technician Use Only

Smart Features

This Whirlpool refrigerator has built-in Wi-Fi® connectivity, which enables many other features to be accessed by a remote device such as a smart phone, computer, tablet, etc. Below is a summary of these additional features that are available for the refrigerator at www.whirlpool.com/smart.

Smart Notifications

- **Power-Out Alert**

  In the event the refrigerator loses power, the consumer will be notified when power is restored. This will allow the customer to react appropriately in order to avoid or minimize loss of food.
- **Door Open Alert**

  The consumer will receive a notification if either door (refrigerator or freezer) is left open for longer than 10 minutes.
- **Power-On Nudge**

  The refrigerator will send a message after power is lost and then restored and if the temperature of the refrigerator is out of range.
- **Water Filter**

  This feature enables the consumer to receive the refrigerator water filter change notification remotely.

Smart Assistant

- **Vacation Assistant**

  The consumer shall be able to display the refrigerator's "vacation" mode state, and toggle vacation mode ON or OFF. Setting the refrigerator to low-energy mode when it won't be opened for a while saves money and energy.
  NOTE: changing temperature setpoint will deactivate Vacation mode if it was active after one hour.
- **Temp Set Assistant**

  The consumer shall be able to display and adjust the Refrigerator and Freezer compartment temperature settings.
  NOTE: changing temperature setpoint will deactivate vacation mode if it was active.

Smart Stats

- **Start Date**

  Displays the appliance start date.

Smart Energy

- **Energy Advisor**
- **Rate Revealer**
- **Smart Delay**

  Allows the consumer to monitor, manage, and control their energy consumption.

Buy Supplies

- **Water Filter**
- **Extended Warranty**

Notes

Section 7: Clothes Dryer

This section provides product specific information, error codes, component locations, and wiring diagram for the “Clothes Dryer Smart Appliance.”

- Model Number
- Location of SAID & Serial Number Tag
- Smart Appliance Component Locations
- Smart User Interface
- ECM (External Communications Module)
- Front & Rear Antennas
- Current Transformers
- Clothes Dryer Error Codes
- Clothes Dryer Component Tests
- Clothes Dryer Wiring Diagram
- Clothes Dryer Smart Features

For Service Technician Use Only

Model Number

Original Model Number	WED98HEX*
Smart Appliance Model Number	WEL98HEBU*

** Represents color & engineering revision*

The only difference between the original model and the Smart Appliance model are the Smart Appliance components; Smart User Interface, ECM, Antennas, and Current Transformers.

If the clothes dryer is hooked up without Internet service, it will function similar to a non-Smart Appliance clothes dryer.

Location of SAID and Serial Number Label for ECM

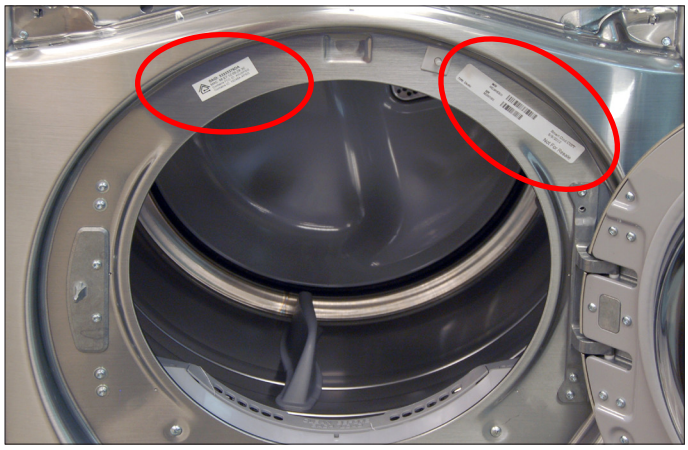


Figure 1 - Location of SAID & Serial Number Label

Clothes Dryer Smart Appliance Components & Locations

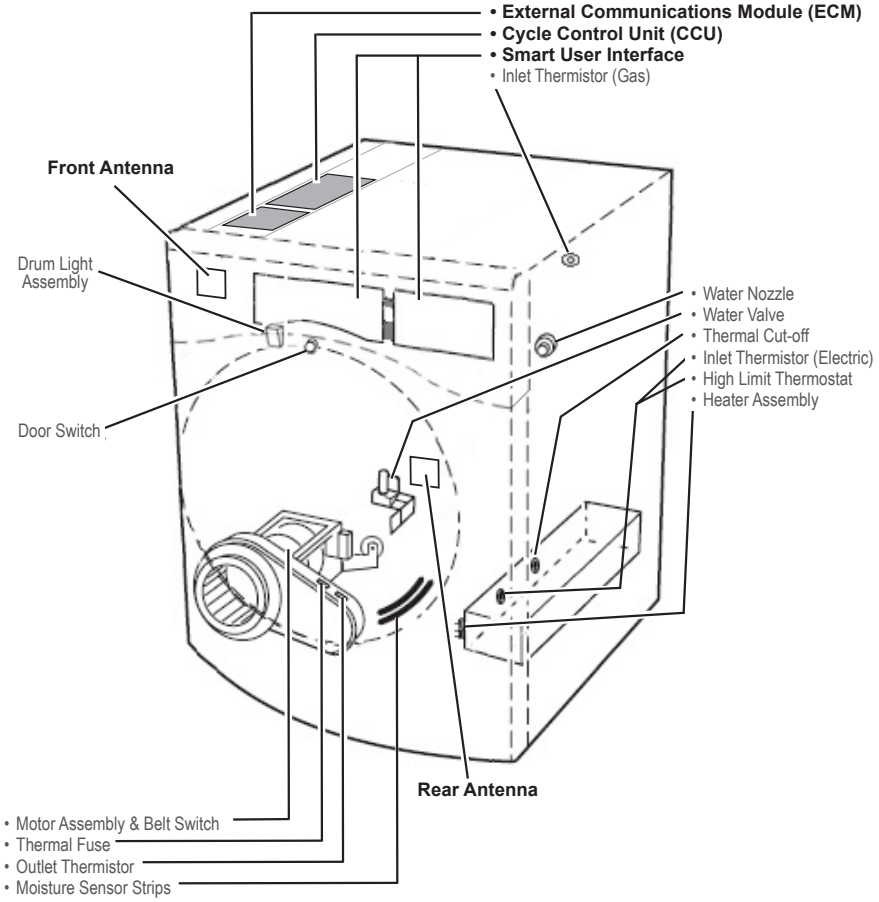


Figure 2 - Smart Appliance Parts Location

For Service Technician Use Only

Smart User Interface

The Smart Grid button (A) is used to enable and disable the dryer's compliance with Smart Grid signals. Touching the Smart Grid button toggles its state between ON and OFF. This is a system setting that is not saved. Therefore, once the dryer has powered on/off again or the cycle has run from start to complete, then the setting shall return to the default (ON).

Figure 3 - Clothes Dryer Smart User Interface

A. Smart Grid button provides Override feature
Blue = On – Smart Grid Enabled
Blue = Off – Smart Grid Disabled
Blinking Blue = Provisioning

B. Smart Grid Delay Indicator

ECM (External Communications Module)

The ECM provides the interface between the Smart Appliance and the Wi-Fi® network (Internet). The ECM is positioned forward of the Appliance Control Unit (ACU) on the PCBA bracket. See figure 4.

- Wi-Fi® radio module
- Power Measurement circuit
- Switch Mode Power Supply
- Common cross-category design

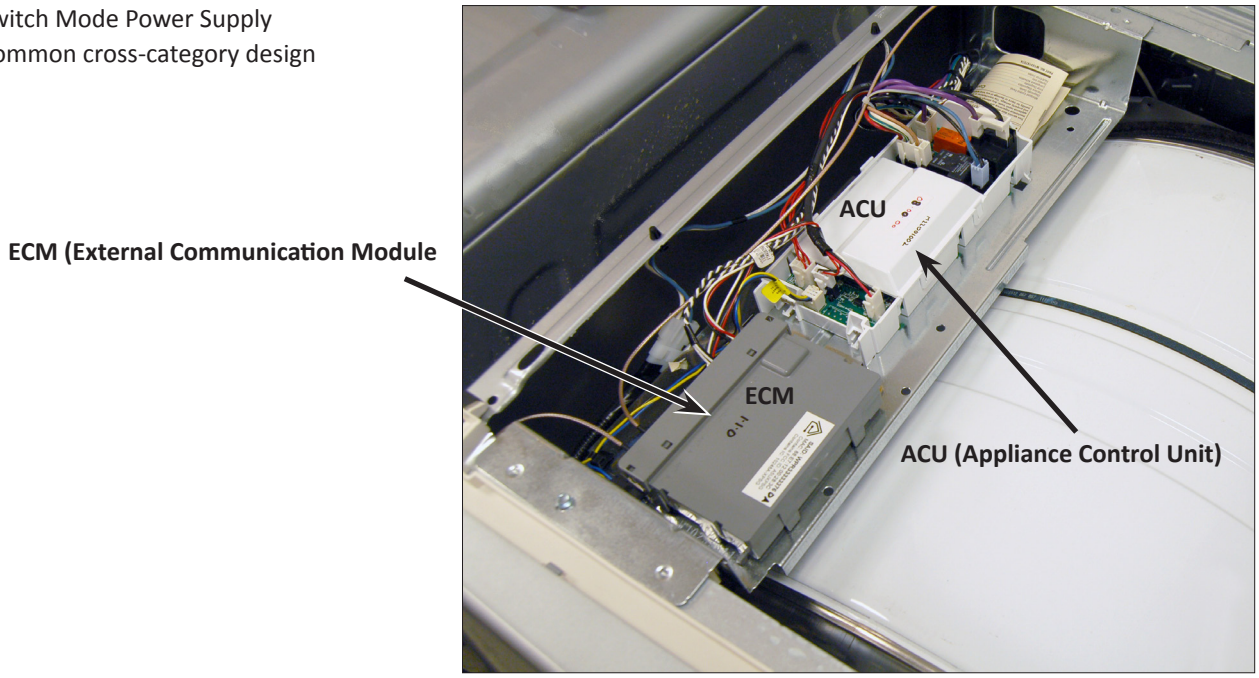


Figure 4 - Clothes Dryer ECM Location

For Service Technician Use Only

Front & Rear Antennas

- Two antennas are necessary to provide robust Wi-Fi® coverage
- Same antenna design is used inside the front console and rear panel of clothes dryer (see figures 5 & 6)
- Common cross-category design

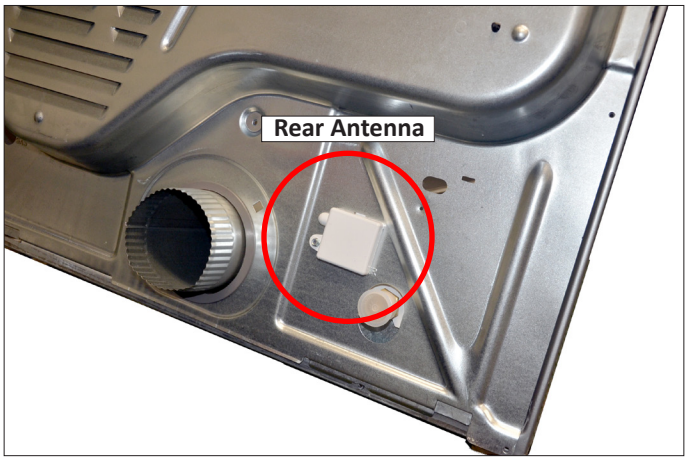


Figure 5 - Rear Antenna Location

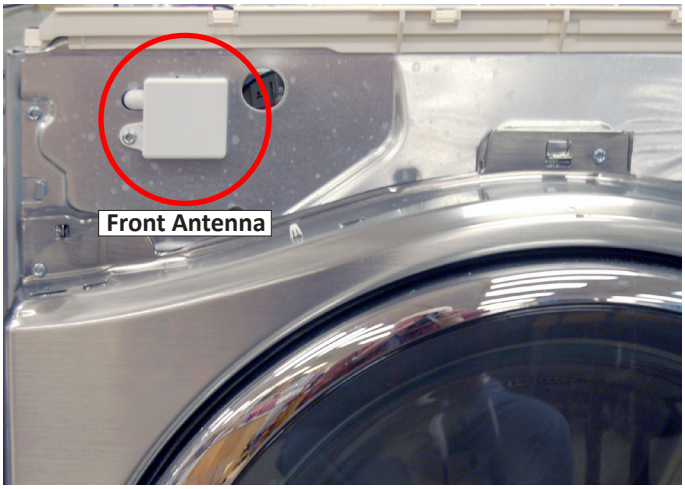


Figure 6 - Front Antenna Location

Current Transformers

- Acts like an amp probe to measure entire machine current so that actual power can be calculated
- Current transformer is integrated into the appliance wiring harness of the clothes dryer
- Two current transformers are required on electric dryers (L1 & L2)
- Common cross-category design

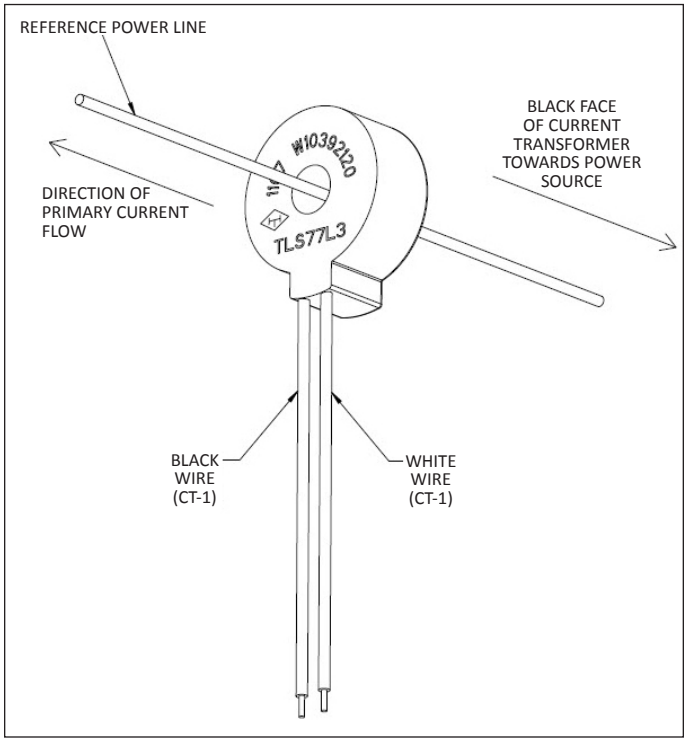


Figure 7 - Current Transformer

⚠ WARNING

Electrical Shock Hazard

Disconnect power before servicing.

Replace all parts and panels before operating.

Failure to do so can result in death or electrical shock.

Clothes Dryer Smart Appliance Error Codes

CLOTHES DRYER SMART APPLIANCE			ERROR CODES	
			Dryer	
Problem Failure	Cause	Check	Function	Problem
No communication between ECM and Control	▪ Loose connection in ECM or Control ▪ Communication bus or loose connection on ECM L1/N	1. Unplug appliance or disconnect power and check all connections to ECM. 2. Remove cover on ECM, restore power and visually inspect and verify that the LEDs D30 – D32 are on or flashing. If not, power off the unit and replace the ECM. If the LEDs are on and flashing, then power off the unit, reinstall the ECM cover and continue checking other components (the ECM is working properly. Problem is elsewhere).	FC	E0
No link between ECM and Wireless Router	▪ Appliance not linked to wireless router	Press and hold Smart Grid button for 20 seconds, press WPS button on wireless router and press and release the Smart Grid button within 2 minutes.	FC	E1
No link between ECM and Internet	▪ The appliance is not receiving signal from the wireless router.	Press the Smart Grid button; if an error tone sounds, check to be sure the router is on and connected to the Internet.	FC	E2
Antenna A problem	▪ Loose connection in Antenna A circuit	Unplug appliance or disconnect power and check all connections in Antenna A circuit. Fix/replace Antenna A.	FC	E3
Antenna B problem	▪ Loose connection in Antenna B circuit	Unplug appliance or disconnect power and check all connections in Antenna B circuit. Fix/replace Antenna B.	FC	E4
Current Transformer A problem	▪ Loose connection in Current Transformer A circuit	Unplug appliance or disconnect power and check all connections in Current Transformer A circuit. Fix/replace Current Transformer.	FC	E5
Current Transformer B problem	▪ Loose connection in Current Transformer B circuit	Unplug appliance or disconnect power and check all connections in Current Transformer B circuit. Fix/replace Current Transformer.	FC	E6
Provisioning problem	▪ A timeout occurs, multiple responses from wireless router, or message failures during linking process.	Check the following: 1. WPS Button on the wireless router was not pressed within 2 minutes of starting the linking mode on the appliance. This may require two people to complete within the 2-minute time frame. 2. The wireless router must be set to enable WPS provisioning. Verify the router is setup to broadcast its SSID, MAC filtering is disabled and that either WPA or WPA2 wireless security is enabled. 3. You must complete the linking process for one appliance before beginning to link the next. 4. The wireless router is too far away from the appliance, or there is too much interference (microwave oven, fluorescent lights, etc.) between the router and appliance. If possible, place the wireless router closer.	FC	E7

For Service Technician Use Only

Clothes Dryer Component Tests

1. Activate Service Diagnostic Mode.
2. From the Diagnostic Home Screen, select Component Activation. From the Component Activation Screen (Figure 8), you can activate and perform functional testing of system components and sensors. When a component is selected from the Component Activation menu, a screen appears providing component information, and if available, attributes related to the component.

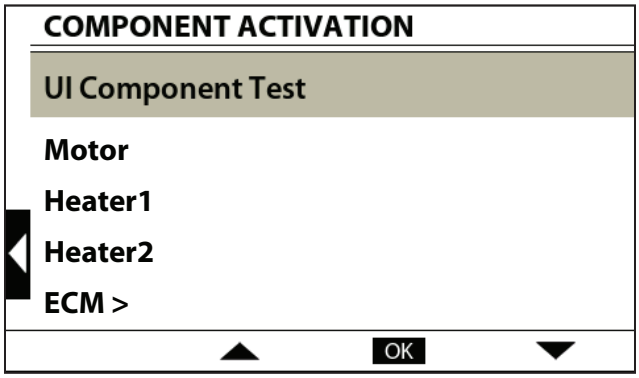


Figure 8

3. From the Component Activation Screen, select ECM>. (“>” represents that another menu is available.)
4. From the ECM Screen (see figure 9), select the desired Smart Grid Component test.

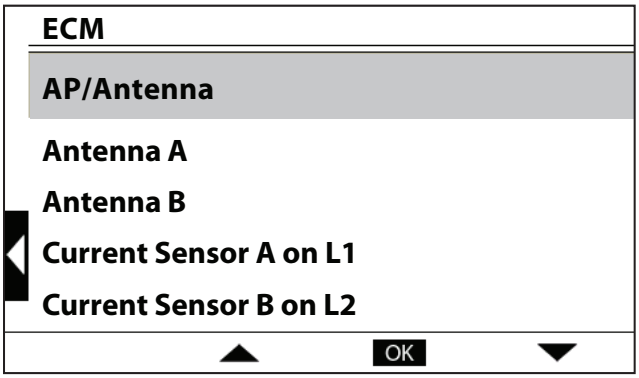


Figure 9

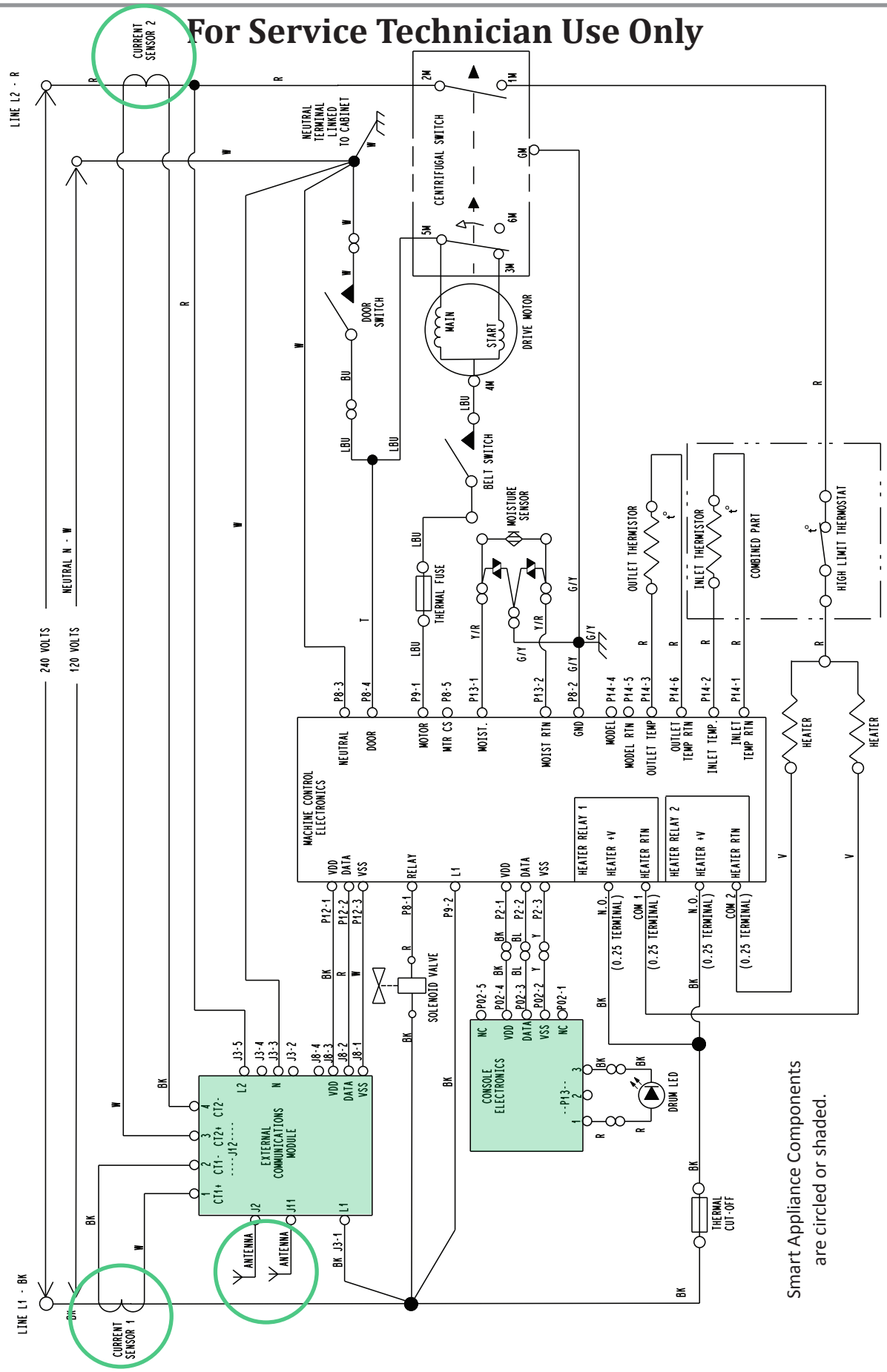
5. The Dryer will perform the selected test and display component status (see Figure 10).

ECM	N/A	Status (Pass/Fail)
AP/Antenna	N/A	Status (Pass/Fail)
Antenna A	N/A	Status (RSSI value: –65 to –100 [red], too weak; –55 to –65 [yellow], poor signal; –55 to 0 [green], good signal).
Antenna B	N/A	Status (RSSI value: –65 to –100 [red], too weak; –55 to –65 [yellow], poor signal; –55 to 0 [green], good signal).
Current Sensor A on L1	N/A	Status (Pass/Fail)
Current Sensor B on L2	N/A	Status (Pass/Fail)

Figure 10 - ECM Component Status

For Service Technician Use Only

Clothes Dryer Wiring Diagram



Smart Appliance Components are circled or shaded.

Figure 11 - Clothes Dryer Wiring Diagram

For Service Technician Use Only

Smart Features

This Whirlpool dryer has built-in Wi-Fi® connectivity, which enables many other features to be accessed by a remote device such as a smart phone, computer, tablet, etc. Below is a summary of these additional features that are available for the clothes dryer at www.whirlpool.com/smart

Smart Notifications

- **Error Message**

  The consumer can be notified by e-mail, text, or app push if their dryer experiences an issue that requires service.
- **Airflow Alert**

  Continuously monitors the air flow from the dryer, alerting the consumer to lint buildup or other obstructions in the dryer's duct work that can increase drying times and energy use.
- **Clothes Dry**

  Receive an e-mail, text, or app push when the current drying cycle is complete, eliminating the need for repeated visits to the dryer to check the status of the drying cycle.

Smart Assistant

- **Wrinkle Shield™ Cycle Assistant**

  If the consumer can't get to the dryer right away to remove the load, they can remotely activate Wrinkle Shield™ to help avoid wrinkling of the load until it's removed from the dryer.
- **Remote Start/Pause**

  Allows user to start or pause their Dryer remotely using the Smart appliances app.

Smart Stats

- **Start Date**

  Displays the appliance start date.
- **Cycle Counter, Cycle Progress**

  Allows the consumer to remotely check on the progress of a drying cycle, providing up-to-the-minute information on what cycle is running, how dry the load is, and the estimated time remaining in the cycle. This takes the guesswork out of when to remove items you may want to iron or hang up while slightly damp.

Smart Energy

- **Energy Advisor**
- **Rate Revealer**
- **Smart Delay**

  Allows the consumer to monitor, manage, and control their energy consumption.

Buy Supplies

- **Extended Warranty**

Section 8: Clothes Washer

This section provides product specific information, error codes, component locations, and wiring diagram for the “Clothes Washer Smart Appliance.”

- Model Number
- Location of SAID & Serial Number Tag
- Smart Appliance Component Locations
- Smart User Interface
- ECM (External Communications Module)
- Front & Rear Antennas
- Current Transformer
- Clothes Washer Error Codes
- Clothes Washer Component Tests
- Clothes Washer Wiring Diagram
- Clothes Washer Smart Features

For Service Technician Use Only

Model Number

Original Model Number	WFW98HEX*
Smart Appliance Model Number	WFL98HEBU*

** Represents color & engineering revision*

The only difference between the original model and the Smart Appliance model are the Smart Appliance components; Smart User Interface, ECM, Antennas, and Current Transformer.

If the clothes washer is hooked up without Internet service, it will function similar to a non-Smart Appliance clothes washer.

Location of SAID and Serial Number Label for ECM

Figure 1 - Location of SAID and Serial Number Label

Clothes Washer Smart Appliance Components & Locations

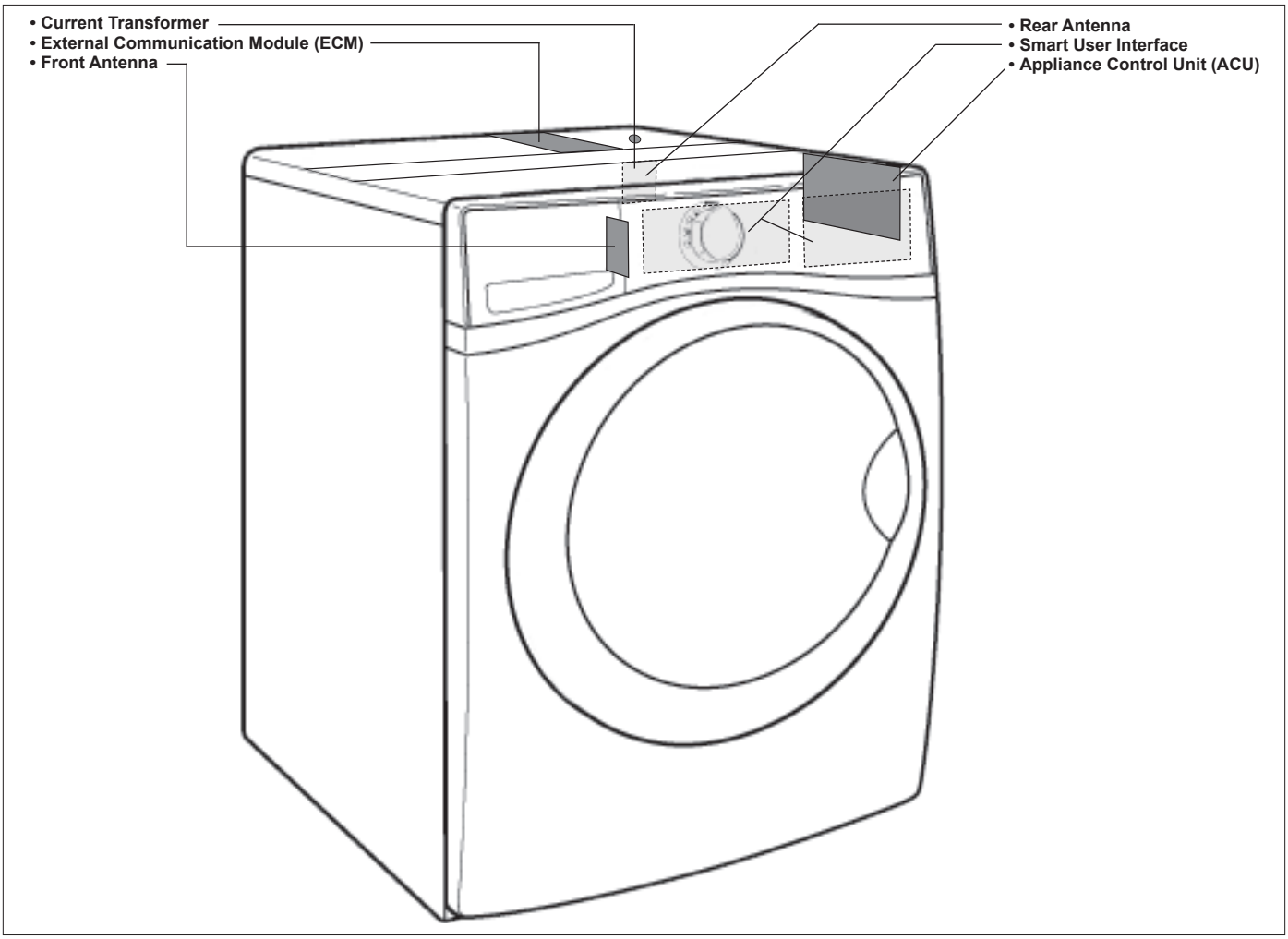


Figure 2 - Smart Appliance Parts Location

For Service Technician Use Only

Smart User Interface

The Smart Grid button is used to enable and disable the washer's compliance with Smart Grid signals. Touching the Smart Grid button (A) toggles its state between ON and OFF. This is a system setting that is not saved. Therefore, once the washer has powered on/off again or the cycle has run from start to complete, then the setting shall return to the default (ON).

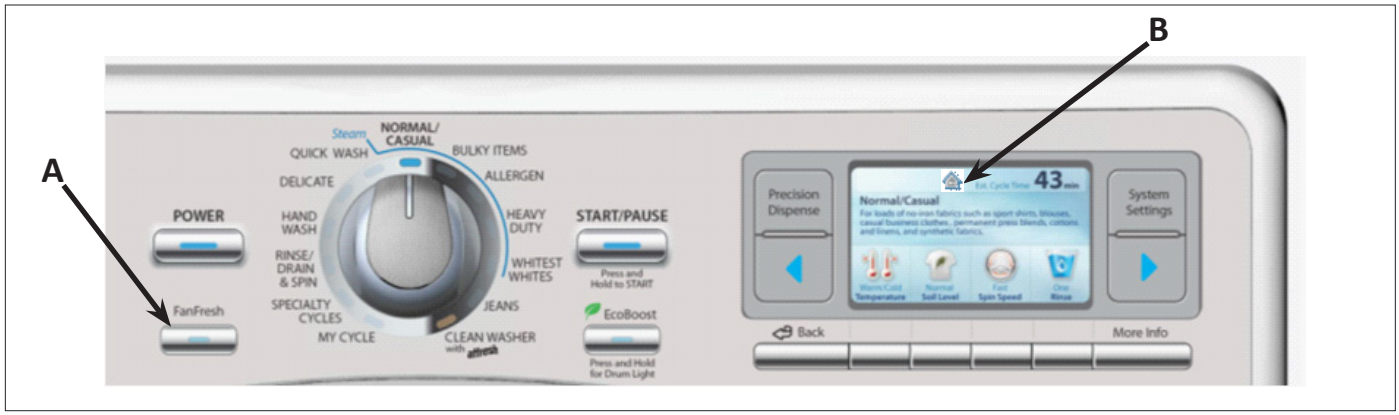


Figure 3 - Clothes Washer Smart User Interface

A. Smart Grid button provides Override feature
Blue = On – Smart Grid Enabled
Blue = Off – Smart Grid Disabled
Blinking Blue = Provisioning

B. Smart Grid Delay Indicator

ECM (External Communications Module)

The ECM provides the interface between the Smart Appliance and the Wi-Fi® network (Internet). The ECM is located under the top panel to the left of the Expansion Board as viewed from the front.

- Wi-Fi® radio module
- Power Measurement circuit
- Switch Mode Power Supply
- Common cross-category design

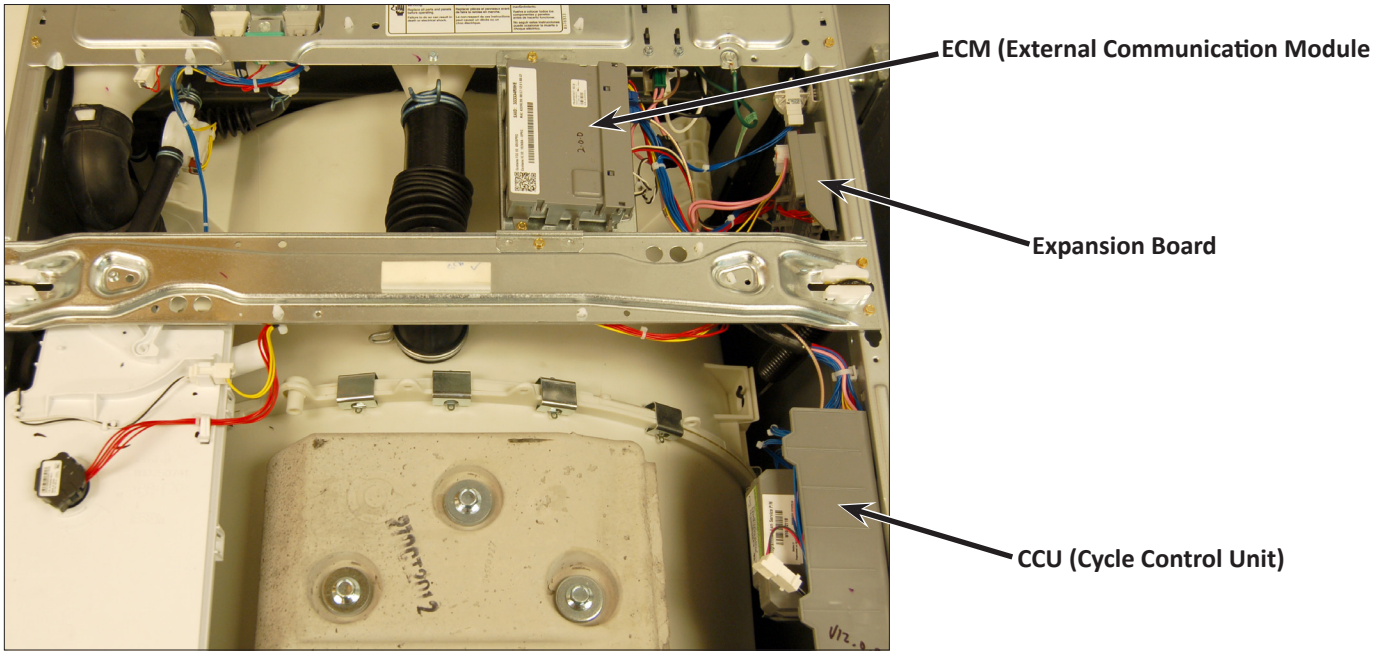


Figure 4 - Clothes Washer ECM Location

For Service Technician Use Only

Front & Rear Antennas

- Two antennas are necessary to provide robust Wi-Fi® coverage
- Similar antenna design is used behind the front console and rear of clothes washer (see figures 5 & 6)
- Common cross-category design

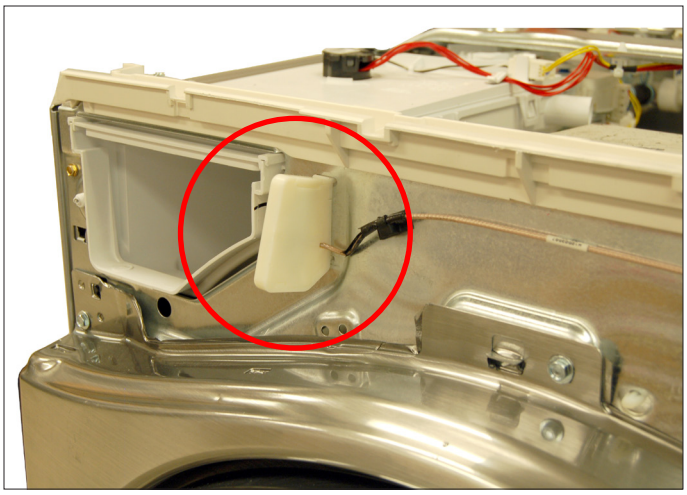


Figure 5 - Front Antenna Location

Figure 6 - Rear Antenna Location

Current Transformer

- Acts like an amp probe to measure entire machine current so that actual power can be calculated
- Current transformer is integrated into the appliance wiring harness of the clothes washer
- Current transformer is located to the right of the ECM if viewed from the front
- Only one current transformer is required on washers
- Common cross-category design

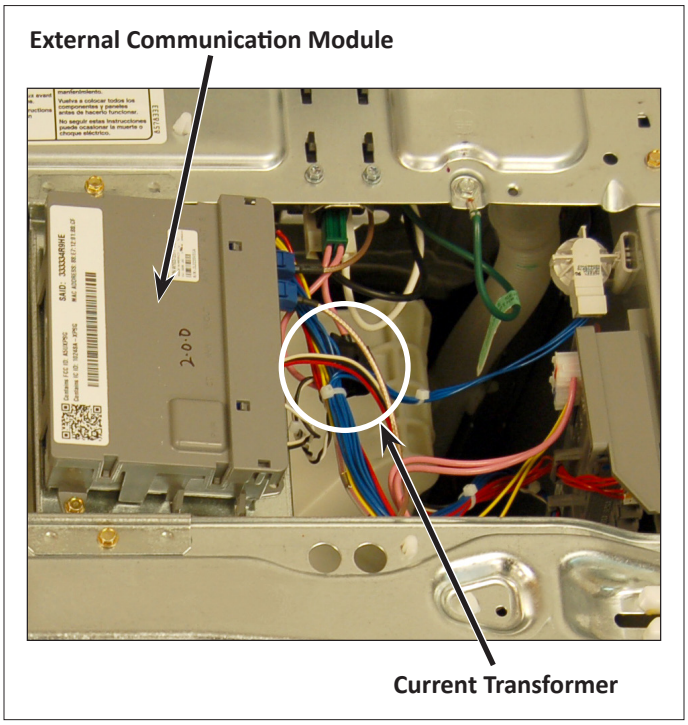


Figure 7 - Current Transformer Location

⚠ WARNING

Electrical Shock Hazard

Disconnect power before servicing.

Replace all parts and panels before operating.

Failure to do so can result in death or electrical shock.

Clothes Washer Smart Appliance Error Codes

CLOTHES WASHER SMART APPLIANCE			ERROR CODES	
			Washer	
Problem Failure	Cause	Check	Function	Problem
No communication between ECM and Control	▪ Loose connection in ECM or Control ▪ Communication bus or loose connection on ECM L1/N	1. Unplug appliance or disconnect power and check all connections to ECM. 2. Remove cover on ECM, restore power and visually inspect and verify that the LEDs D30 – D32 are on or flashing. If not, power off the unit and replace the ECM. If the LEDs are on and flashing, then power off the unit, reinstall the ECM cover and continue checking other components (the ECM is working properly. Problem is elsewhere).	FC	E0
No link between ECM and Wireless Router	▪ Appliance not linked to wireless router	Press and hold Smart Grid button for 20 seconds, press WPS button on wireless router and press and release the Smart Grid button within 2 minutes.	FC	E1
No link between ECM and Internet	▪ The appliance is not receiving signal from the wireless router.	Press the Smart Grid button; if an error tone sounds, check to be sure the router is on and connected to the Internet.	FC	E2
Antenna A problem	▪ Loose connection in Antenna A circuit	Unplug appliance or disconnect power and check all connections in Antenna A circuit. Fix/replace Antenna A.	FC	E3
Antenna B problem	▪ Loose connection in Antenna B circuit	Unplug appliance or disconnect power and check all connections in Antenna B circuit. Fix/replace Antenna B.	FC	E4
Current Transformer A problem	▪ Loose connection in Current Transformer A circuit	Unplug appliance or disconnect power and check all connections in Current Transformer A circuit. Fix/replace Current Transformer.	FC	E5
Provisioning problem	▪ A timeout occurs, multiple responses from wireless router, or message failures during linking process.	Check the following: 1. WPS Button on the wireless router was not pressed within 2 minutes of starting the linking mode on the appliance. This may require two people to complete within the 2-minute time frame. 2. The wireless router must be set to enable WPS provisioning. Verify the router is setup to broadcast its SSID, MAC filtering is disabled and that either WPA or WPA2 wireless security is enabled. 3. You must complete the linking process for one appliance before beginning to link the next. 4. The wireless router is too far away from the appliance, or there is too much interference (microwave oven, fluorescent lights, etc.) between the router and appliance. If possible, place the wireless router closer.	FC	E7

For Service Technician Use Only

Clothes Washer Component Tests

1. Activate Service Diagnostic Mode.
2. From the Diagnostic Home Screen, select Component Activation. See figure 8.

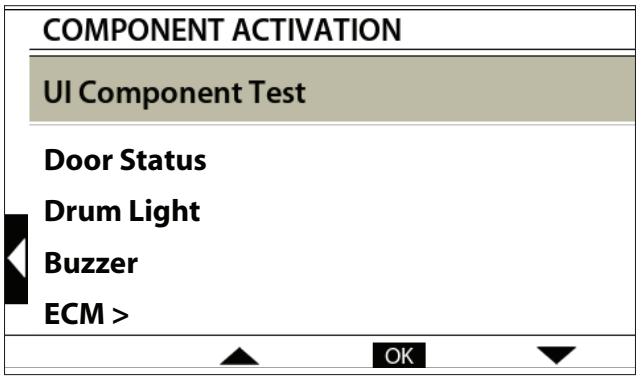


Figure 8 - Component Activation Screen

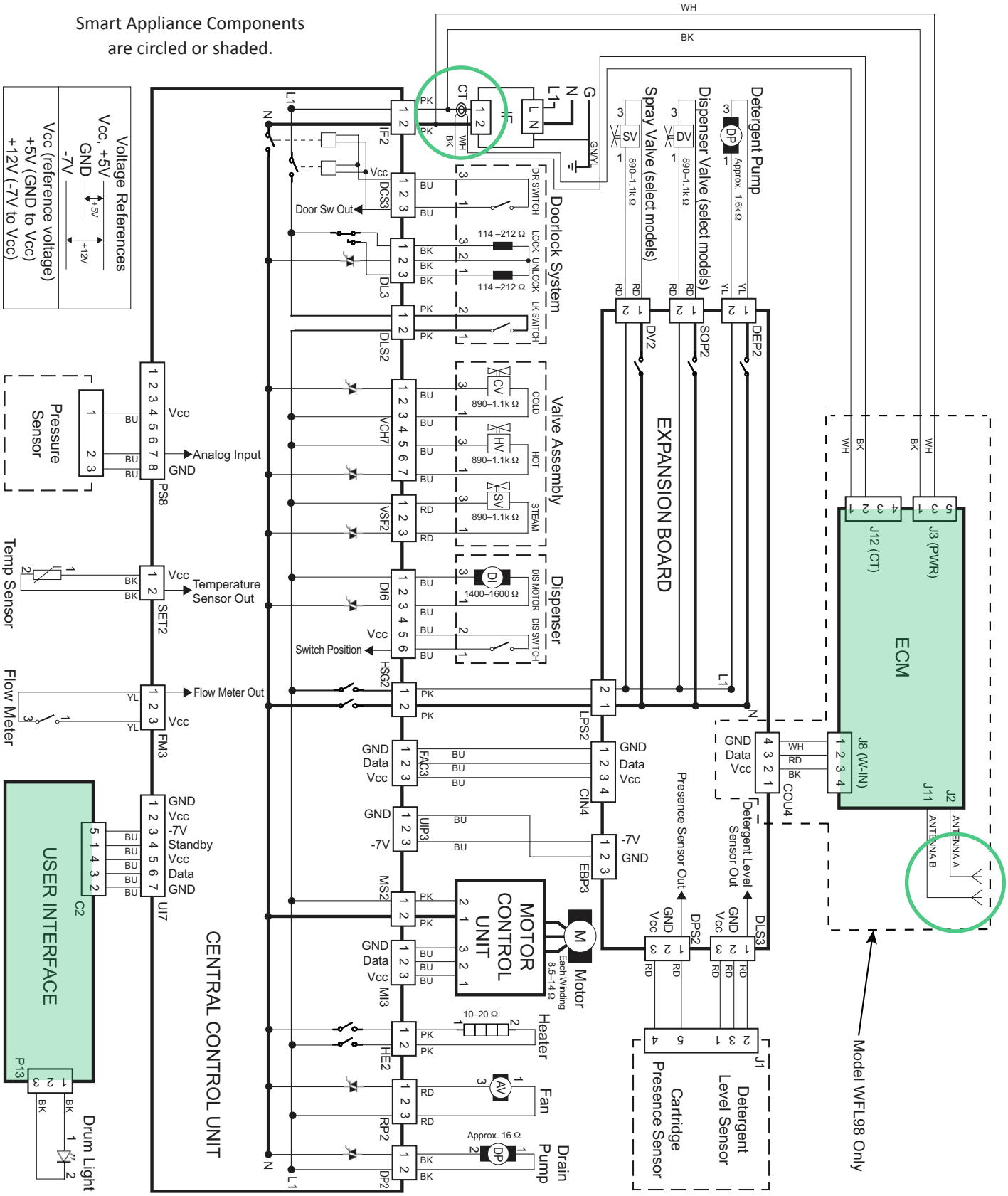
3. From the Component Activation Screen, select ECM.
4. The washer will perform a test on the ECM and provide a PASS/FAIL status as shown in Figure 9.

COMPONENT ACTIVATION MENU		
OUTPUT	**ON/OFF**	**DETAILS**
UI Component Test	YES	Status (On/Off)
Door Status	N/A	Status (Open/Closed)
Drum Light	YES	Status (On/Off)
Buzzer	YES	Status (On/Off)
ECM	**YES**	**Status (Pass/Fail)**

Figure 9 - Component Activation Menu

For Service Technician Use Only

Clothes Washer Wiring Diagram (figure 10)



For Service Technician Use Only

Smart Features

This Whirlpool washer has built-in Wi-Fi® connectivity, which enables many other features to be accessed by a remote device such as a smart phone, computer, tablet, etc. Below is a summary of these additional features that are available for the washer at www.whirlpool.com/smart

Smart Notifications

- **Error Message**

  The consumer can be notified by e-mail, text, or app push if their washer experiences an issue that requires service.
- **Detergent Nudge**

  The washer will send notifications every cycle regarding the status of the detergent dispenser.
- **Affresh® Nudge**

  This feature enables the consumer to receive remotely a notification that the washer recommends an Affresh® cycle to be run. Affresh® keeps the washer smelling fresh and clean when used once per month.
- **Clothes Clean**

  Receive an email, text, or app push when the current wash cycle is complete, eliminating the need for repeated visits to the washer to check the status of the wash cycle.

Smart Assistant

- **FanFresh Cycle® Assistant**

  If the consumer can't get to the washer right away to remove the load, they can remotely activate FanFresh® while the washer is running to activate the fan, and tumble the load periodically to keep their laundry fresh.
- **Remote Start/Pause**

  Allows user to start or pause their Dryer remotely using the Smart appliances app.

Smart Stats

- **Start Date**

  Displays the appliance start date.
- **Cycle Counter, Cycle Progress**

  Allows the consumer to remotely check on the progress of a wash cycle, providing up-to-the-minute information on what cycle is running and the estimated time remaining in the cycle.

Smart Energy

- **Energy Advisor**
- **Rate Revealer**
- **Smart Delay**

  Allows the consumer to monitor, manage, and control their energy consumption.

Buy Supplies

- **Affresh® Washer Cleaner**
- **Extended Warranty**

PRODUCT SPECIFICATIONS & WARRANTY INFORMATION SOURCES

IN THE UNITED STATES:

FOR PRODUCT SPECIFICATIONS AND WARRANTY INFORMATION CALL:

PHONE: 1-866-930-3712

FOR TECHNICAL ASSISTANCE WHILE AT THE CUSTOMER'S HOME CALL:

THE TECHNICAL ASSISTANCE LINE: 1-800-832-7174

HAVE YOUR STORE NUMBER READY TO IDENTIFY YOU AS AN AUTHORIZED IN-HOME SERVICE PROFESSIONAL

FOR LITERATURE ORDERS (CUSTOMER EXPERIENCE CENTER):

PHONE: 1-866-930-3712

FOR TECHNICAL INFORMATION AND SERVICE POINTERS:

www.servicematters.com

REGISTER APPLIANCES / DOWNLOAD WIRELESS SETUP UTILITY APP:

mysmartappliances.com

IN CANADA:

FOR PRODUCT SPECIFICATIONS AND WARRANTY INFORMATION CALL

PHONE: 1-866-930-3712

FOR TECHNICAL ASSISTANCE WHILE AT THE CUSTOMER'S HOME CALL:

THE TECHNICAL ASSISTANCE LINE: 1-800-488-4791

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